MONTANA OUTDOORS

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MONTANA OUTDOORS

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the cover

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a livable environment for WILDLIFE is a quality environment for MAN

TOWARD A BETTER RELATIONSHIP

Each year we emphasize the importance of good relations between landowners and recreationists. And each year, we think we see these relations improve.

Of course, there are still those few who make the bad news—and the bad relations. But we're confident these few will eventually be weeded out, and a conscientious sporting public will prevail.

I'd like to use this column to report several new developments on this important subject:

• Although unplanned by us, our recent criticism of haphazard subdivision development in prime wildlife areas has done something to strengthen this relationship. Ranchers and farmers can painfully see what runaway rural development is doing to the agricultural land resource. In Flathead County alone, *one sixth of all agricultural land* (Classes I-IV as established by the Soil Conservation Service) *has already been subdivided.* In view of statistics like this, it's easy to see why agricultural interests are concerned about a more sensible approach to rural land development. Testifying to this, our department joined the major agricultural groups in support of strong subdivision legislation during the last legislative session.

• Last year, we distributed a litter bag to sportsmen and landowners. The plastic bag—we call it "The Hunter's Bag"—was a cooperative effort between the Montana Stockgrowers Association and our department. Judging from the feedback we had, the bag was warmly received *and used.*

• In this issue of *Montana Outdoors*, we're urging hunters to report any suspicious activity that could mean livestock rustling. Modern-day rustlers have put a serious financial bite on the livestock industry. Ranchers would appreciate all the help they can get.

• Annually, our information staff prepares and distributes articles and news items, TV and radio programs which stress the importance of good landowner/recreationist relations. We hope these efforts help.

• And last, this is the first year for landowner preference on antelope permits. Any landowner owning 160 acres of agricultural land inhabited by antelope gets first chance at a permit in that hunting district.

Perhaps these are all "small things." But we feel every step in the right direction counts. We plan to continue to do everything we can to improve landowner/sportsman relations. Hopefully, all landowners and sportsmen will do the same.

Wes Woodgerd

Wes Woodgerd, Director
Department of Fish and Game

the hunter's moon

By Bill Schneider

It hangs in the autumn sky like a large pumpkin, colored yellowish-orange and casting spells on America's 16 million hunters. It rises at sunset and stays until sunrise, never fading, dominating the October sky for 14½ hours.

It's the Hunter's Moon.

Each year, the sun passes directly over the equator twice—once in spring and again in autumn. This year, the Spring Equinox, as it's called, was March 21. And the Autumn Equinox will arrive Sept. 23. On these two dates, days and nights will be the same length everywhere.

Through history, the full moon nearest the Autumn Equinox has been called the Harvest Moon because it occurs during the traditional gathering of agricultural crops. The full moon after the Harvest Moon is the Hunter's Moon.

This year the Hunter's Moon first rises Oct. 31. So about then you may—provided you're a hunter, that is—become suddenly restless. Don't blame your glazed look and nervous notions on anything but the moon above. The spell is incurable, so accept it.

This particular moon causes some friction in households with one or more hunters. A wife wonders what evil has entered her loved one. Days before the season's opening, he spends sleepless nights for no apparent reason. He scurries around the house during daylight hours searching for some obscure bit of sporting equipment or darts down into the basement to grease his boots in somber solitude.

He comes home from work carrying little brown sacks containing waterproof matches, cartridges, a compass, candy bars—you name it. He designates a spot in the basement

or attic for laying out everything he'll need when the big day arrives. He cleans, oils, blues and shines his poor firing arm until he could shave in its barrel's brilliance. (Secretly though, he's dreaming about those few days when he won't touch a razor to his weathered face.)

If he's a bow hunter, it may be even worse—with those relentless practice sessions. And, of course, the edge on his arrows must put a razor blade to shame.

Everything is ready days in advance. Then, his bizarre behavior takes a turn, and not necessarily to the good.

He restlessly saunters around the house with pocketed hands, staring out windows. Often, he mutters something about "not getting out much" or "this year will be different." Perhaps he even touches his softening tummy and envisions himself negotiating steep slopes, sleek and raw-boned.

On the eve of the season's opening his life goes frantic. He rushes around stuffing packs, filling cartridge belts or laying every piece of apparel and gear in the exact order it will be picked up the following morning.

The alarm is set for 4 a.m.—just early enough to allow two dark hours at the edge of his hunting area waiting for first light. (The household may be spared this last-minute frenzy if the hunter decides to leave a day early and camp out to make sure he's the first one there.) But whatever, the hunter invariably sits, silently waiting for the sun to leak its first rays over the horizon and onto his quarry.

Now, he sees it—the Hunter's Moon—this force that so fills him with anticipation. He yawns after a sleepless night, as he watches it sink slowly from sight.

As he views it, he ponders how hunting has become steadily less important to his larder, and steadily more important to his life. Seldom does he head for the forests or fields longing for meat, and never because his family would go hungry if he failed. Now, he longs for those days when he, the hunter, can test himself against the hunted—man against animal.

He might also realize how fortunate he is. As more and more demand is placed on the land, less and less room remains for wildlife.

While he sits silhouetted against the moon, he thinks of all those Americans who will never feel what he now feels. Silently, he thanks nature for renewing the wildlife resource each spring and making this moment possible. Thinking of the game he hopes to take today, he is comforted knowing it will be replaced the following spring. Somehow, the moon seems to grow larger and brighter as he watches. The spell is secure in this sportsman.

As he returns to his cozy fireside or warm home that night, he again sees it. Right at sunset, as if hurrying to get at another night's spell-casting, the Hunter's Moon rises.

Under its light, the hunter comes home happy. With or without game, he's still in good spirit and anxious for the next hunt.

Hunters have always responded to nature's beckoning. And hopefully, they always will. So in the next few weeks—or more specifically, on Oct. 31—should you get a sudden and uncontrollable urge to check your rifle for rust or your archer's eye for accuracy, don't fret. The Hunter's Moon is shining on you.

Welcome it. It could make you a better man.

illustration by
Donita Eaton

MONTANA HUNTING: what does the future hold?

By Mike Aderhold

WHAT IS THE future of hunting in Montana? While hunters increase, space to hunt and habitat capable of supporting game animals decreases. Hunting—as we know it—*will* change.

The public owns about one-third of Montana. The rest is privately owned. Because it affects management decisions, land ownership is of vital importance to wildlife. Vegetation, water and soil—"habitat" in a word—determine wildlife abundance. And use and management of the land determines the condition of wildlife habitat.

Wildlife, by tradition, custom and law (dating back to the Magna Charta, 1215), belongs to the people. In Montana, "the people" have appointed the Department of Fish and Game to manage this resource.

The department owns relatively little land, thus limiting its ability to manage and manipulate "habitat." The department does, however, set and enforce hunting rules and regulations based on wildlife and habitat inventories and research. And the department also promotes wise land use and advises various land management agencies and private landowners on wildlife issues and proper land management measures.

In many parts of the country, decreasing availability of privately owned wildlife habitat creates a situation which far surpasses the capacity of fish and game agencies to provide license buyers with a place to hunt. Many departments of fish and game find themselves in the unusual position of knowing how to manage a highly prized commodity—wildlife—without being able to put this knowledge into practice.

This is not the case in Montana yet because we have a big state and only about 720,000 people (4.8 per square mile). But the shadow of this situation has already crossed the state.

- In 1973, large blocks of private land in southeastern Montana were closed to the public.
- The best duck and pheasant hunting areas in western Montana (for example, in the Flathead Valley) have been closed to general hunting for several years.

• Rural areas near larger cities are checkered with posted properties. And groups of landowners petition the department for special consideration and threaten closure of their land if the requests are denied.

• Over 25 private duck hunting clubs exist in the state; the number and acreage increases annually.

• Landowners charge fees to hunt in such remote areas as North Garfield County near the Charles M. Russell National Wildlife Range, Beaverhead County near the Idaho border and north Toole County near the Sweetgrass Hills just below Canada.

There's no doubt that private individuals own the most productive two-thirds of Montana. Public domain, in many cases, is the land nobody wanted, the land that was tried and rejected, the land that didn't yield valuable minerals or support a pioneer family in settlement days. Even though public domain might sustain a lower agricultural yield than fertile private land, it still supports much vital wildlife habitat. And with better management, it could produce even more wildlife.

But what about the private landowner and his relationship to wildlife? Every landowner realizes that the wildlife on his land belongs to everyone. However, he also knows the land produces a livelihood for his family. In most cases, this interest is foremost.

Obviously, if wildlife and hunters interfere with economic production of the land, the landowner becomes concerned. Private landowners feed a good portion of this state's wildlife, which takes a slice of the profit if the private land is used for agriculture. The value of what he gives up to benefit wildlife increases as taxes and the price of his product rise. Some landowners accept as payment the sight, sound and presence of wild animals, and welcome hunters to harvest surplus animals. Others want nothing to do with either wildlife or hunters.

A few hunters exact a cost far greater than most landowners are willing to bear. Odd-hour phone calls, littering, cut fences, open gates, scared stock and a general lack of respect for the landowner—this cost can become *too high*. The immediate solution is easy; next year, "POSTED" signs go up.

Put yourself in the landowner's place. He didn't increase the popularity of hunting. He didn't improve access roads or create crowded hunting conditions. He didn't invite "too many" hunters to his place. Yet *he* has the problem and its real solution requires time and effort—and that's yet another cost.

With each posted acre, the situation tightens. People pressure and the increasing destruction of life and property force other private landowners to follow their neighbor's example. The situation worsens. The next step isn't too hard to figure out. If the majority of private land is removed from public access, public land and its use by recreationists becomes even more important. continued

IS THE LANDOWNER LIABLE TO RECREATIONISTS ON HIS LAND?

The liability of a possessor of land to a person coming on his land (for any reason) depends on the status which the law ascribes to that person.

Three general classifications, each with a specific legal meaning, follow:

1. Invitee—one who enters for a purpose connected with the business of the possessor (i.e., a business visitor).
2. Licensee—one who is privileged to enter or remain on land by virtue of the possessor's consent (i.e., a social guest).
3. Trespasser—one who enters or remains upon land without possessor's consent.

In general the responsibility, legal duty, owed to each classification is as follows:

1. The duty to an invitee is substantial. The possessor has a duty to the invitee to exercise ordinary care to keep those portions of the premise where the invitee may be expected to come and go in a reasonably safe condition. He is liable to those who without their own fault are injured by his failure to do so.

2. The obligation to a licensee is greater than that owed to a trespasser and less than that owed an invitee. A possessor is not under obligation to change his methods of operation, alter the condition of the premises or make other special preparations for the licensees who enter his property. The possessor is under no duty to maintain the land in a safe condition, but he is under a duty to see that the licensee is warned of any danger.

3. A possessor of land owes a trespasser no duty to discover, remedy or warn of dangerous conditions. A trespasser who is tolerated on the premises becomes a licensee.

These rules are general; they are in the realm of common law and apply in the absence of a specific statute. Anyone with a specific concern in this area should consult his own legal adviser.

SPECIAL STATUTES COVERING RECREATIONAL USE

Montana, along with many other states, recently enacted special statutes limiting a landowner's liability to recreationists. Most state statutes on this subject are patterned after a 1965 Model Act recommended to the states by the Council of State Governments (a joint agency of all state governments). The basic purpose of the suggested legislation encourages landowners to allow persons to use their lands for recreational purposes without charge.

This is accomplished by reducing the liability of the landowner by specifically stating that when a landowner gives free permission for another to use his land, he is not making any assurance of land safety or conferring the status of invitee or licensee on the user.

The act implies a continuation of the common law rules stated above where the landowner charges for use. In such a case, the landowner would be liable to the user as an invitee.

Montana's recreation liability statute is stated as follows:

67-808. Restriction on liability to gratuitous licensee for recreation. A landowner or tenant who permits by act or implication, any person to enter upon any property in the possession or under the control of such landowner or tenant for any recreational purpose without accepting a valuable consideration therefore, does not by granting such permission, extend any assurance that such property is safe for any purpose, nor confer upon such a person the status of invitee or licensee to whom any duty of care is owed, and such landowner or tenant, shall not be liable to such person for any injury to person or property resulting from any act or omission of such landowner or tenant, unless such act or omission constitutes willful or wanton misconduct.

67-809. Recreational purposes defined. Recreational purposes as used herein shall include hunting, fishing, swimming, boating, water skiing, camping, picnicking, pleasure driving, winter sports, hiking or other pleasure expeditions.

As hunting land decreases, sportsmen might have to re-examine the notion that hunting, the out-of doors and all that goes with it is free. After one purchases a firearm, hunting license and some camping gear, he is ready to "live off the land" and when he brings home his game it's "free meat." This just isn't so.

Most people forget that hunting never was free. When man hunted to survive, he spent much of his waking time at it. It "cost" dearly. The success of our hunting ancestors was a function of luck and patiently honed skills. Today, it's a function of time, technology and money. (A review of any "hunting magazine" confirms this.) Evaluating hunting on the cost of game per pound makes no sense at all.

What does make sense, though, is the reward from the outdoor experience. Hunting is a great outdoor sport. But the quality of this experience will deteriorate as game habitat shrinks and economic demands on the carrying capacity of game ranges increase. There exist a few hunters who obviously get nothing from the outdoor experience, but who do succeed in making things worse for others. Here, the individual sportsman can really do something for the future of hunting. Weed out the few who contribute to bad relations with the landowner. And then, educate them about the consequences of their wrong-doings.

Decreasing hunting space isn't the worry of hunters alone. Departments of fish and game across the country have fought the problem since the early 1920s. On the East Coast, with little public land, the battle is already lost for most hunters. Most of the better hunting goes for a price. And that price is too high for many sportsmen.

Here in Montana this problem is still colt size and we can learn from mistakes and successes of others. The following department efforts have helped to keep private lands open:

- legislation such as the Model Act (see inset) concerning the liability of landowners to recreationists,
- purchasing hunting areas and access corridors,
- contributions to the State Department of Livestock for predator control, which is intended to open more private land to the hunting public,
- noting the landowner preference for permit hunts,
- year-round campaigns to teach hunter safety and educate sportsmen,
- promoting the importance of landowner/sportsman relations by recognizing the landowner's contributions and publicizing his role through articles, news items and radio and TV spots,
- setting special seasons and cooperating with large stockmen's and landowner's groups and
- establishing special management areas near population centers with many hunters (such as Square Butte for the Great Falls-Lewistown area and Blackfoot for the Missoula-Deer Lodge area) where the department assists in control of public recreation use.

Even with these efforts, the department is still losing ground. We must redouble efforts to delay additional closing of private land by expanding educational efforts.

The department should examine the motives behind closing land to hunting, explore incentives to keep land available, implement imaginative programs to inform the hunter about sport hunting ethics, promote understanding between the department, sportsmen and landowners and adjust programs to fit the primary use of private land. Conservation agencies throughout the country are testing these methods with varying success. The Montana Department of Fish and Game will no doubt benefit from these better ideas. But it still will not solve the basic problem of hunter numbers and available habitat containing a huntable game population.

All things considered, this topic of future hunting and future rights of access is a very complex problem. It will benefit all of us to try and simplify the entire affair by establishing an individual rapport with Montana landowners who are willing to grant the privilege for public recreation on their private property. Landowners must be convinced by our actions that landowner/sportsman relationships can be mutually beneficial ties, not one-way streets where the landowner comes out the loser.

THE LAW

PRIVATE LAND—LANDOWNER'S RIGHTS

In every state, landowners in possession (holding the legal rights) and tenants in possession (owners in time) may use the land exclusively for their own benefit, maintain sole possession and be free from any unauthorized entry upon their premises. Both owners and tenants of real estate have the right to keep others from interfering with the exclusive use, possession and enjoyment of their property.

Every landowner and tenant is legally free to choose who may enter the property. Those he does not wish to enter may be kept from doing so. (From "Limiting Liability When Property is Used for Outdoor Recreation," Vol. 1—Legal Aspects, Berger, Lawrence et al. Great Plains Agricultural Council Publication No. 46, 1970)

PUBLIC LAND

Adoption of the Taylor Grazing Act of 1934 ended free public grazing. Before passage of the act, unappropriated public domain was available for free grazing. Anyone could graze stock on public domain as long as he did not prevent anyone else from doing likewise.

Now, before anyone may graze stock on public domain, the land must have been designated for grazing, and the stockowner must have obtained a permit to use the land. Such permits give the stockowner a limited right on the land: ". . . grazing privileges recognized and acknowledged shall be adequately safeguarded but the creation of a grazing district or the issuance of a permit pursuant to the provisions of this chapter shall not create any right, title, interest or estate in or to the lands."

The sole right of the permittee on the land is to graze stock on it. He does not have the right to choose who may enter public land nor does he have the right to keep anyone from doing so. 43 U.S. Codes Annotated 315 et. seq. (1964)

The landowner or tenant in possession controls private access, on private land, to public land. He does not control public access (county, state or federal roads) to public land.

The Greenwood Subdivision: Residents search for solutions, but find only frustration.

By Bill Schneider

Flooding in the Greenwood development, south of Missoula on the Bitterroot River.

"What do we do now?"

IN PART TWO of a controversial article on rural subdivisions published in the May/June 1974 *Montana Outdoors*, we pointed to the Greenwood Addition, south of Missoula along the Bitterroot River, as one example of bad land development.

We questioned the logic of putting a high-density subdivision in a flood-prone area protected by a dike made of wash gravel scooped from the Bitterroot's streambed and floodplain.

We noted the dike's construction and reinforcing caused considerable damage to the river's natural channel and aquatic life.

We predicted the development would flood again, as it did in 1972, even though the dike had been improved.

And we asked, "What will happen to Greenwood Addition... when a real flood comes . . .?"

This spring, Greenwood residents had a taste of what will happen. The dike fractured, allowing the Bitterroot to flood this area as it has periodically through history. (The area isn't officially classified as floodplain, but it's expected to be later this year.) High ground water surfaced in the area, further complicating the situation.

It wasn't the kind of flood that endangers lives. However, private property loss ran into the thousands of dollars, no doubt.

(The Geological Survey computes the level of flooding on the main stem of the Bitterroot at Lolo as "slightly over a 50-year flood" in 1974. This compares with "no more than a 25-year flood" for 1972.)

But property loss wasn't the only source of anguish for Greenwood residents. The high water infiltrated the sewer system through inadequately sealed manhole joints and mobile home standpipes and breaks in the sewer lines.

These leaks allowed "too much" water into the sewer, forcing

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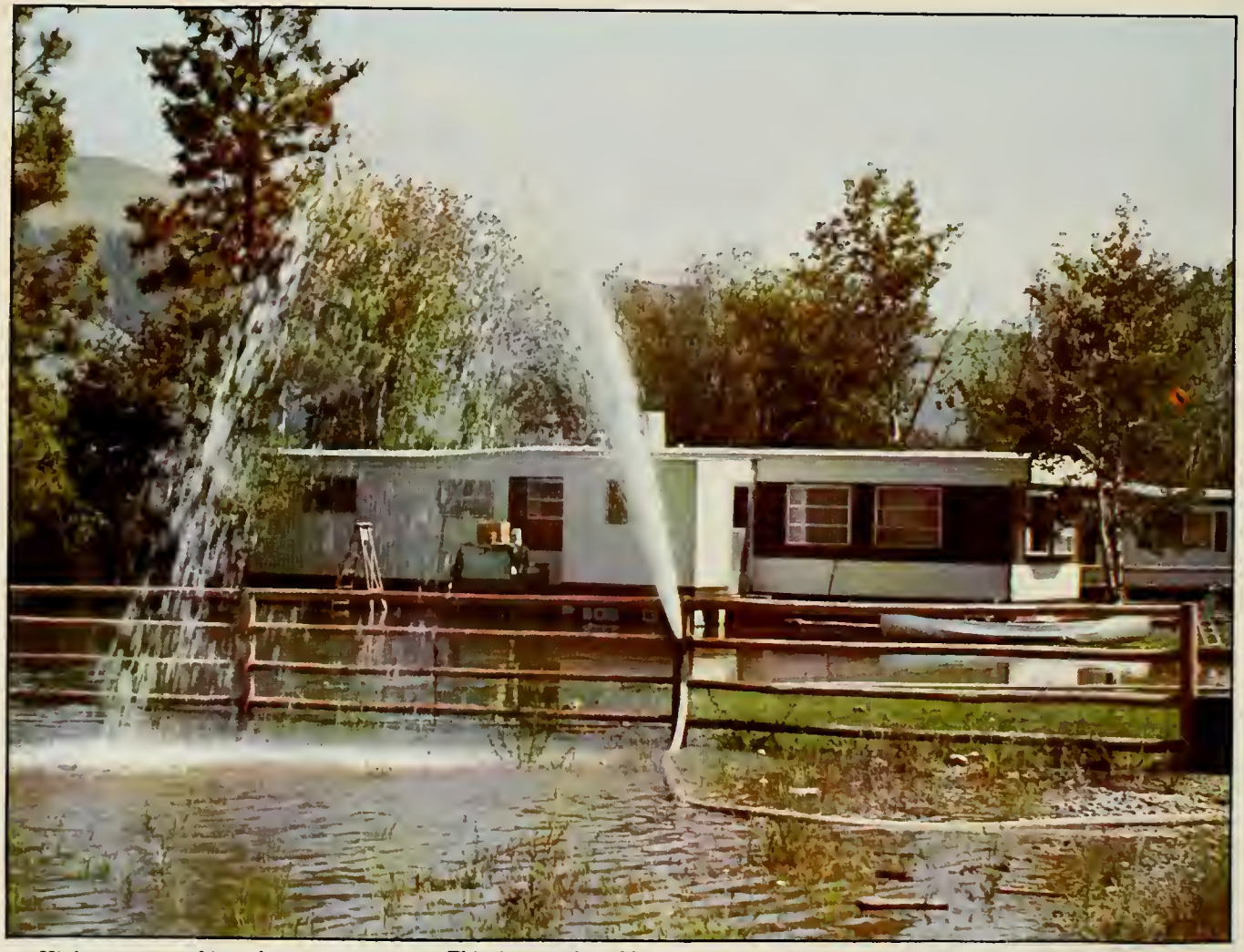


High water seeped into the sewerage system. This, in turn, forced health officers to permit the pumping of raw sewage directly into the Bitterroot to keep the entire system from failing. F&G photo by Robert Rothweiler

Missoula City-County Health Department officials to permit operators of the sewer system to pump raw sewage and flood water directly into the Bitterroot.

"Obviously, this creates a health hazard to the people in the immediate flooded area as well as those downstream," noted Dr. Kit Johnson, city-county health officer. "However, we feel that there is no alternative as otherwise the entire sewerage system would fail."

This, of course, raised the ire of local residents. Having their homes flooded was enough, but having raw sewage dumped almost into their front yards was too much. They bitterly complained, but mostly to no avail.

They wanted the dike repaired, but nobody—the county, the developers or the Corps of Engineers—would do it.

Several of them said the developers and/or REALTORS[1] promised them the dike would protect them from flooding. And thus, it was their responsibility to immediately correct the problem. However, a REALTOR active in selling Greenwood lots told MO, "They're wrong. There were no such guarantees."

The residents became totally frustrated. Their homes were standing in water. Raw sewage was flowing through their housing development. Nobody would help. And they had no assurances that it would be any different next spring.

"What do we do now?" one of them appropriately asked.

Johnson, for one, wants to help. He is, in fact, doing everything he can to get the development closed.

For a start, he wrote Don Willems of the Water Quality Bureau of the State Department of Health and Environmental Sciences, "We have to presume that flooding in this area will be a reoccurring event. These houses are obviously built in a floodplain. Moreover, there is considerable doubt as to whether the legal and financial obstacles will ever be overcome to allow adequate diking to protect this area.

"For these reasons," he continued, "it is my strong recommendation that you proceed with permanent closure of the sewer line serving the Greenwood Addition. If the line is not closed or in a similar manner, secured

continued

[1] *According to a spokesman for the Montana Association of REALTORS, the word "REALTOR" is always capitalized since it is a registered logo.*

"Although there is some equipment in the area, I have
been assured that they [the developers] have not, and
will not, conduct any dredging operations in the river.

This dredge sat idle on the Greenwood property last June during the flooding. So far this year, it hasn't been used in the river, and judging from the above statement made by the developer's lawyer, it won't be in the future. F&G photo by Bill Schneider

(Left) The much discussed (and cussed) dike constructed to protect Greenwood residents. (Right) The spot where the dike washed away this spring. F&G photos by Bill Schneider

against repeated episodes of this nature, unquestionably we will be forced to repeatedly pump raw sewage into the Bitterroot River during flood stage with needless exposure of the public to the possibility of epidemic and infectious diseases."

After receiving the letter, Willems told MO he wasn't sure the bureau had legal authority to close the line, but he was certainly looking into the possibility.

After two housewives came to the Missoula City-County Board of Health meeting June 21 and almost broke into tears when describing their dilemma, Johnson and the board took further action.

In an official request from the board, they asked Chuck Parrett, chief of the Floodway Management Bureau of the State Department of Natural Resources and Conservation, to declare the dike unsafe. This would, of course, allow the Missoula County attorney to stop the development. (And word is, he would do just that.)

The board cited Montana's Dam Safety Law as a basis for declaring the dike unsafe. Parrett said one small problem exists because the dikes covered in this statute must be at least 25 feet high. And he wasn't sure this dike was. However, he plans to send two men to find out. If the dike is indeed that high, he thinks there is a good possibility his agency would declare it unsafe.

Also of concern to the Department of Fish and Game is possible reconstruction of the dike. We contacted Norman Truax, one of the developers, and he said they really haven't finalized any course of action at this time. So he couldn't say when or if the dike would be repaired. However, he did assure us the developers would do whatever was needed to make sure it wouldn't happen again. Truax also says they tried to help the flooded landowners whenever they could last June.

A REALTOR involved in the project says the developers have discussed the possibility of constructing a smaller dike to protect the present residents and then abandoning plans to further develop the area. (The developers own more land near the Greenwood Addition.) But Truax implied that they almost had to go ahead with developing the area now, because of their financial commitment in the site.

The 1-¼-mile dike was built by the original developer, Riverside Development Co., after the county commissioners approved the subdivision in 1968. And then in 1973, 2,700 feet of it were improved by Hindsight Associates, the present developer, who purchased the development from Riverside.

Hindsight is hampered by a court injunction prohibiting them from increasing the height of the dike. This action was instigated by eight landowners in the Rodeo Ranchettes subdivision (just downstream and on the other side of the Bitterroot) because they claimed the dike is causing the river to wash away land in their development.

(Incidentally, the county commissioners have a Nov. 16, 1973 letter from Laurence Eck of Goldman, McChesney and Datsopoulos, a law firm representing the developers. In this letter, Eck states, "Although there is some equipment in the area, I have been assured that they [the developers] have not, and will not, conduct any dredging operations in the river.")

Now, there's a problem for the county, the developers, the Greenwood and Rodeo Ranchette residents and the Bitterroot and the aquatic life it supports. So what's the answer?

Lud Browman of the Missoula County Commission probably has it. "We've been trying to stop [the Greenwood development] for years," he said. "We figured this would happen. And it did."

The commissioners assured MO that if Greenwood came before them today, they would deny it. Unfortunately, they said, the previous commission which approved the subdivision did not have adequate authority to refuse it.

Montana has many examples of good land development. But it also has some graphic examples of development that serve nobody's interest—except fattening the land developer's pocketbook. With Greenwood and numerous other bad developments, the best solution is no longer a feasible option—to deny the development in the first place.

THE CATCHALL

Montana Grizzlies–Extinct By 1990 ?

To the contrary, if the same general conditions prevail for the next two or three decades, sizable grizzly populations will still exist in the state. While this view is based on Department of Fish and Game information for Montana grizzlies, several national organizations have expressed the opposite opinion, primarily in regard to Yellowstone Park.

Since 1969, studies in the park and National Park Service (NPS) management of grizzly bears have been newsworthy items. Resulting articles, initiated largely by crusading groups, received national coverage and pressure to curtail the hunting of grizzlies resulted.

In the past five years, grizzly management in Montana has changed from stewardship based on game department studies and information, to political pressures that make the issue nationally important. A resulting question concerns the sovereign rights of state game departments to manage wildlife within their boundaries of jurisdiction.

The Marine Mammal Protection Act, passed by the U.S. Congress in 1972, caused a great deal of alarm. This act applies to the polar bear (as well as to other mammal species) and it effectively prohibits Alaska from controlling and managing this animal. Alaska conducted studies of polar bears, and made progressive management refinements—at least until passage of this act which now places authority over polar bears with the federal government. Alaska is still petitioning the federal government to allow the state to manage the polar bear.

The political climate surrounding the grizzly bear may indicate a destiny similar to that of Alaska and the polar bear. Under provisions of recent federal legislation known as the Endangered Species Act, states must pass enabling legislation within a specified time period, or the federal government (Bureau of Sport Fisheries and Wildlife) will assume management responsibility over such species. The grizzly is not an endangered species in Montana, but the Fund for Animals, a national animal protection organization based in Washington, D.C., has petitioned the Department of Interior to place the grizzly on the endangered list. The organization has also asked the Department of Interior to use its authority under the Endangered Species Act to close the upcoming (1974) grizzly hunting seasons in Montana and Wyoming.

In addition, the Wildlife, National Parks and Conservation Association, the Sierra Club and Friends of the Earth recently requested the chief of the U.S. Forest Service, John McGuire, to prohibit the hunting of grizzlies in national forests. This request coincided with a civil action lawsuit by the Fund for Animals against Interior Secretary Rogers C.B. Morton, NPS Director Ronald Walker and Yellowstone Park Superintendent Jack Anderson. The suit charged that policies of these agencies were dooming the grizzly population of Yellowstone Park to extinction, the last large "refuge" for grizzlies in the lower 48 states. The lawsuit was withdrawn in late February 1974 with the understanding that the defendants would provide a draft impact statement by July 1974 and also that results of a National Academy of Science study would be made public as soon as available.

Obviously, these demands are emotional and based primarily on the situation in Yellowstone Park. Unfortunately, they have occurred completely without any knowledge or consideration of Montana Department of Fish and Game policies, programs or plans for Montana grizzlies. Even worse, the department now faces federal take-over of grizzly management in Montana because, apparently, emotion rather than fact guides federal decision making.

We recognize our responsibility to insure the grizzly's future in Montana. At the present time and under existing conditions, hunting does not jeopardize this animal. Over the past 7 years, department information shows that 26 to 48 grizzlies were killed each year, but only 53 per cent of these were taken by hunters. The information on distribution, sex ratios and age classes does not indicate that Montana grizzlies are in any danger. In fact, reproduction, distribution and density information indicates that grizzlies are generally at favorable levels and actually increasing in some areas. In others, a further increase in bear numbers may result in an increase in marauding or nuisance individuals and increased control actions might result. Frequently, the control action is an immediate kill of the bear by a property owner.

It is foremost in the department's responsibility that any impending hazard to Montana grizzlies will initiate effective restrictive measures for the welfare of this animal. With a knowledge that the issue of not hunting will persist, the department is continuing current studies on grizzlies and cooperative programs with the Forest Service, NPS and the states of Wyoming and Idaho.

We would conduct this research anyway, even without the current

continued

controversy. Our primary concern relates to a continued viable environment in Montana for the grizzly—this, in turn, will insure the grizzly's future and importance as a game animal.—*Ken Greer*

QUIMBY RECEIVES EINARSEN AWARD

The northwest section of The Wildlife Society recently honored Dr. Don C. Quimby of Montana State University with its Einarsen Award.

Presented annually on behalf of over 800 professional wildlife workers in five states and three Canadian provinces, the award honors Dr. Quimby for his "outstanding professional achievements and contributions to the field of wildlife management." The award was instituted in memory of Arthur Einarsen, leader of the Oregon Cooperative Wildlife Research Unit.

Dr. Quimby

Dr. Quimby came to MSU in 1948 and created a program in wildlife management. Today the program is recognized for its unique philosophy, productivity and the quality of training it offers. His work also includes several pioneering scientific studies on elk biology.

He received bachelor's and master's degrees from North Texas University and his Ph.D. in economic zoology from the University of Minnesota.

He and his wife, Mary, have two sons.

AERO TAKES OFF

AERO is off the ground. Sparked by ideas generated at a recent conference on alternative energy sponsored by the Northern Plains Resource Council, the Alternative Energy Resource Organization (AERO) formed.

The group has three main purposes: (1) to gather and publicize information on wind power, solar energy and methane production from wastes; (2) to organize people to be an effective force when alternative energy sources could be used instead of conventional fossil fuel or nuclear energy and (3) to promote and aid in establishing demonstration models of alternative energy-producing devices and alternative energy research centers.

Kye Cochran, Billings, is administrator. Board members include: John Brown, Circle; George Oberst, Noxon; Terry Shorb, Powell, Wyo.; Elizabeth and Wilbur Wood, Roundup, and Anne Charter, Terry Mattison, Al Rutan and Ken Taylor, all of Billings.

AERO will publish a monthly newsletter, as well as various fact sheets and pamphlets. A year's membership costs $10. To join or obtain additional information, write: AERO, 418 Stapleton Building; Billings, MT 59101.

TEACHERS BEWARE

Teachers and school administrators must be watchful of the type of program and teaching aid they purchase and use lest they inadvertently promote anti-hunting sentiment in the classroom.

Two recent examples are: (1) distribution to schools of a classic anti-hunting movie, "Say, Goodbye" and (2) formation of a splinter group of the Humane Society of the United States (HSUS), called Kindness in Natures Defense (KIND), with the specific objective of convincing students that hunting is a cruel and biologically unnecessary sport. Through KIND, established under the National Association for the Advancement of Humane Education, HSUS anticipates having 5,000 teachers promoting anti-hunting by the end of this year.

RESTING, NOT NESTING

The cutline on page 38 of the July/August 1974 *Montana Outdoors* should have read: "Undercut banks often provide safe 'homes' and resting sites for trout."

DEPARTMENT FILM HONORED

A department film, "Your Land," was recently honored by an international group of public affairs professionals.

The American Association for Conservation Information (AACI) ranked the film second of 11 entries in the television category of its annual competition. It

contributors

Every year the number of hunters increases. But each year hunting space and habitat capable of supporting game animals decreases. Mike Aderhold asks, "What is the future of hunting in Montana"? It's a hard question to answer but one statement is bound to come true: Hunting, as we now know it, is going to change. Aderhold is the department's information officer in Glasgow. See his article on page 4.

Philip Schladweiler, game research biologist for the department in Bozeman, traces the history of the moose in Montana. Did you know, for example, that present moose distribution probably differs little from when white men first visited the region? His article starts on page 26. Schladweiler has just been named to head the department's coyote research project to determine effect of coyote predation on Montana's wildlife. His extensive experience with wildlife radio telemetry will be a real asset in his new position.

As the leader of the department's hunter safety program, Mel Wojcik is surely well qualified to tell readers how to survive in the wilderness if they become lost. He presents some simple rules that will be helpful in any situation: S-T-O-P, he urges—Stop, Think, Observe and Plan. He examines two actual cases of lost hunters and explains why one survived and the other didn't. See page 41.

graphically illustrates the many problems, uses and management options on Montana's public lands. Two years ago, another department film, "The Yellowstone," placed first in the same competition.

AACI membership includes wildlife and natural resources information and education personnel from 45 states and Canadian provinces.

LET THE SUNSHINE IN

And then there was the concerned citizen who attended a conference on energy conservation. The theme was personal energy conservation accomplished by switching off lights, using less water, turning off the TV when nobody was watching, etc.

He noticed the conference was conducted in a room where the drapes were drawn and about forty 100-watt bulbs were lighting the room—even though it was brilliantly sunny outside.

Next time you attend a meeting, open the curtains and turn off the lights. You might even suggest that those attending bring their own coffee cups—rinsing out a reusable cup is more efficient than manufacturing and disposing of the often used styrofoam containers.

COOKING CORN OUTDOORS

You don't have to live anywhere near Iowa to remember the good, fresh taste of corn when it's cooked outdoors. And, you can leave the aluminum foil and grill at home.

Leave the husks on the ears, making sure they're tightly closed. Soak the corn in water about 10 minutes, then drain. Dig down into the center of the campfire and bury the corn under the coals and ashes. Cover it up and let it cook for 18-20 minutes.

The outer husks burn completely black, but the kernels inside are moist, clean and delicious. Use the turned-back husks as handles.

NONGAME BIOLOGIST POSITION FILLED

Dennis Flath recently assumed duties as the department's nongame and threatened species wildlife biologist.

In the newly created position, Flath will conduct surveys and inventories of nongame and threatened wildlife and their habitat needs.

His findings will form the basis for recommendations to the legis-

continued

illustration by Vern Craig

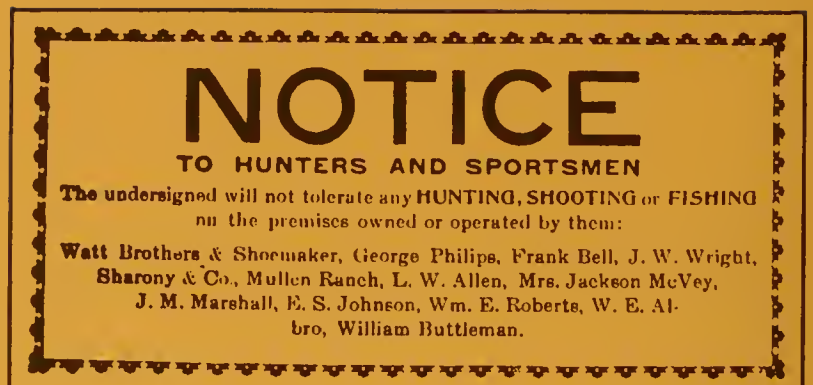
"BOY IF WE DON'T GET A DEER THIS YEAR, I DON'T KNOW HOW I'LL FEED MY FAMILY!"

lature to amend the present list of threatened and endangered species.

A big part of the job will be explaining to the public the management principles for non-game and threatened species.

Prior to accepting the new position, Flath served as a game management biologist for the department in Libby. He holds a B.S. degree in biology from Pacific Lutheran University and an M.S. in wildlife biology from the University of Montana. His master's thesis examined the reproductive success of Canada geese in the Bitterroot Valley.

He and his wife, Helen, have a daughter, Elizabeth.


NOTICE
TO HUNTERS AND SPORTSMEN
The undersigned will not tolerate any HUNTING, SHOOTING or FISHING on the premises owned or operated by them:
Watt Brothers & Shoemaker, George Philips, Frank Bell, J. W. Wright, Sharony & Co., Mullen Ranch, L. W. Allen, Mrs. Jackson McVey, J. M. Marshall, E. S. Johnson, Wm. E. Roberts, W. E. Albro, William Buttleman.

If we told you the above ad appeared in a Montana newspaper within the past few weeks, you would take it in stride and probably mutter something like, "I know, I've seen lots of them." But this notice is from the September 22, 1905 edition of the Pony Sentinel. (Pony is a small town in Madison County.)

How long can a problem last?

WILDERNESS SURVIVAL by Berndt Berglund; Charles Scribner's Sons, New York; 1972, 175 pages, $7.95.

With the exception of the first chapter concerning survival psychology, the remainder of the book would have been better titled, "Wilderness Camping," or "How to Become a Robinson Crusoe." Chapters two through seventeen cover topics such as geography, fire, signals, shelters, snares, hunting and fishing, dressing game, cooking, water, plants, equipment, camp implements, first aid, travel, map and compass reading and knot tying.

No doubt the author is well versed in survival technique, but a number of his statements are obviously from personal observation rather than scientific study. For example, in the chapter discussing fire, he states, "Statistics from most parts of North America show that the camper is the cause of 80 per cent of all forest fires." Writing about wildlife in the Rocky Mountains, the author states, "There are trout in the lakes and streams. Birds are very limited; only a few species can be found, such as the canyon jay and the water ouzel."

He also advocates using a tourniquet without mentioning the dangers. Statements of this sort lead me to believe that other references provide more credible information.

If this book was intended to provide information to save someone's life, it is definitely lacking. Preventive measures to avoid becoming lost and step-by-step procedures to follow when you *are* lost are not even mentioned. The book contains some useful information about shelters, cooking and comfort in the wilderness for those planning to live off the land.—*Mel Wojcik*

THE NORTH AMERICAN WATERFOWLER by Paul S. Bernsen, Salisbury Press, Seattle; 1972, 206 pages, $14.95.

"Many of us fail to realize what we have been blessed with, for all around us lie situations that, if effectively harnessed, can result in a substantial increase in the amount of ducks that we kill."

With this statement, author Paul S. Bernsen captures the spirit of adventure and zest for waterfowling that pervade the 206 pages of "The North American Waterfowler."

As an avid waterfowler, Bernsen's approach to waterfowling impressed me. It represents the most comprehensive treatise that I have ever seen on the subject. The author selects key ingredients from complex topics such as duck and goose calling, blind construction, setting decoys and techniques of shooting and skillfully passes them on to the reader. Other related topics like weather and waterfowl, retrievers, improving waterfowl habitat and running a duck club are also explored in subsequent chapters. Whether you're a jump shooter or a dyed-in-the wool decoy hunter, you can't help but pick up a few pointers that will put more birds in your bag. This is especially true if you hunt under the point system.

Because of lack of proper instruction, duck and goose calling for the beginner is usually a hit-or-miss affair. Bernsen provides not only a pictorial sketch and explanation of the key duck calls such as the "highball" and "lonesome hen call," but also an 8-minute 45-rpm duck calling record. The call charts and record enable you to learn duck calling as the "pros" teach it.

"The North American Waterfowler" is much more than a well-illustrated book about waterfowl and the art of hunting them. Its concluding chapters cover topics ranging from "Mirth in the Marshes," a collection of humorous anecdotes handed down through generations of duck hunters, to Bernsen's favorite waterfowl recipes.

The last chapter—"The Future of Waterfowl Hunting"—is a call to arms, a ringing plea to those who want to dedicate themselves to promoting better waterfowl hunting. The author explains the goals and purposes of Ducks Unlimited and its importance not only to the wildfowler, but also to those who just love to see ducks and geese.

Waterfowl habitat for tomorrow still remains. The breeding stock remains adequate and a good management program with long-range planning is under way. These are the necessary ingredients. Whether they will be dissipated through lack of interest and little aggressive support remains entirely up to the public. If enough citizens believe that waterfowl perpetuation is important, the job can be done. Most would concur with Bernsen when he says, "Ducks Unlimited needs you and you need Ducks Unlimited. Your turn has come to take a turn at the duck factory."—*Ken Walcheck*

Big Game Scenes For Framing

In this issue, we're pleased to bring MO readers a very special feature. We've spent several months searching for some of the best big game photos in the state—and in the nation, for that matter. Montana is indeed fortunate to have many professional wildlife photographers. There are, of course, others besides the four camera pros featured here. In the future, we hope to bring you some of their work.

This feature, "Big Game Scenes for Framing," is exactly that. We think these shots are worthy of adorning anyone's wall. Hopefully you will agree.

In future issues, we'll bring you more selections like this. For example, we tentatively plan a similar picture essay, "Game Bird Scenes for Framing," next year. Don't miss it.—*Ed.*

Jon Cates Route 2 Missoula, MT 59801	**Mule deer, goat, antelope, grizzly, black bear**
Jerry Manley Box 3527 Butte, MT 59701	**Mountain sheep, elk**
Alan G. Nelson 36 Devonshire Townhouses Great Falls, MT 59401	**White-tailed deer**
Danny On 728 Columbia Avenue Whitefish, MT 59937	**Mountain lion, moose**

THE MOOSE

By Philip Schladweiler

AT FIRST SIGHT, the moose looks out of place, a sort of holdover from a long-ago time when lumbering, ungainly creatures roamed the earth. Handsome it's not, but this largest member of the deer family to be found in Montana is well adapted to its environment.

HISTORY

The Shiras moose (*Alces alces shirasi*), the race of moose inhabiting Montana, was first recognized as a distinct subspecies 60 years ago. It was named for George Shiras III, who studied and photographed these animals in Yellowstone National Park in the summers of 1908-1910.

Earliest written accounts of moose in what later became Montana come from the journals of Lewis and Clark. Hunters of that famous excursion encountered moose while ascending the Missouri a few miles above the mouth of the Milk River and again while camped on Lander's Fork, near the present location of Lincoln.

Historical writings indicate that current moose distribution in Montana probably differs little from when white men first visited the region. Abundance, however, has varied considerably in the last 100 years. Montana moose hunting was first regulated in 1872, with an annual closed season from Feb. 1 to Aug. 15. Hunting was banned year-round in 1897 following an apparent decline in numbers. Moose numbers apparently reached a statewide low around 1900. The 1909-10 biennial report of the Department of Fish and Game estimated a statewide population of 300 moose whereas ". . . ten years ago these animals were practically extinct in the state." The largest herd in 1910 was found in the Ross Fork area of Rock Creek in Granite County.

As early as the winter of 1935-36 a Forest Service study in the Absaroka National Forest (now part of the Gallatin National Forest) just north of Yellowstone National Park reported seriously overbrowsed areas and a high percentage of dead willows. (At about the same time, other moose concentrations were recognized in the Flathead, Bitterroot, Big Hole, Ruby, Madison and Gallatin River drainages.) Increased moose populations adjacent to the park are frequently attributed by some to overflow from the park. However at least one investigator pointed out that the naturally favorable habitat outside the park was of almost equal importance. Also, a few moose probably remained in these favorable areas during the low population period.

MOOSE MANAGEMENT

Montana's first positive step toward moose management occurred in the early 1940s when a Department of Fish and Game study documented further range deterioration in the Absaroka Primitive Area. Despite a 1942 recommendation for controlled moose harvests which resulted from this study, legislation enabling Fish and Game Commissioners to set moose seasons was not enacted until 1945. In that same fall, the first open moose season in nearly 50 years occurred.

Intensive scientific studies of Shiras moose were initiated in Yellowstone National Park in 1947. Two Montana studies began in 1958, one in the Rock Creek drainage of Granite County and the second in the upper Ruby River area. These and subsequent Shiras moose studies, including recently completed research covering moose ecology throughout southwestern Montana and concentrating on two study areas in Gallatin County, provide most of the basic information for management of Montana's moose.

RECENT STUDY FINDINGS

The study,[1] completed in 1973, utilized two primary study areas, the lower Gallatin south of Bozeman and the upper Madison in the Hebgen Lake area near West Yellowstone. These areas were selected for intensive study

[1]Schladweiler, P., 1974. Moose ecology in southwestern Montana. Federal Aid Job Final Report, Montana Projects W-98-R and W-120-R. 100 pages.

continued

Friday, May 10, 1805 (at the mouth of the Milk River)
Several of the party went out to hunt the wind rose high Some Squawls of rain. one of the men caught a nomber of fish. the hunters killed 1 fat buffaloe 4 beaver, and 3 Deer. Some of them Saw Some mooce Deer which was much larger than the common deer— (from the "Original Journals of the Lewis and Clark Expedition")

hoto by Jon Cates

because their moose populations exhibit most of the habitat use patterns found in Montana.

Most moose in the lower Gallatin area are "migratory." In late November or early December, they move to low elevation winter ranges (below 7,000 feet). The snow-free months are spent at higher elevations. A few of the moose in this area do not exhibit seasonal movements, but seem to be year-round residents at both high and low elevations.

Vegetation cover types important to moose in this area include Douglas-fir and aspen in winter, and Douglas-fir and lodgepole pine during summer. However, use of the latter appears to be more a matter of "availability" than "choice." During all seasons, Douglas-fir and aspen were used to a greater extent than their occurrence in the overall vegetation of the study area. For example, although Douglas-fir covered approximately 18 per cent of the lower Gallatin area, it never received less than 25 per cent of the use, and accounted for nearly half the use in winter. Similarly, Engelmann spruce-alpine fir and old aged (over 15 years) cutover lodgepole pine received differentially greater use in summer and fall, as did willow in all seasons, except fall.

In the Hebgen Lake area, three different population segments were recognized—two year-round resident herds and a "migratory" herd.

One of the resident herds inhabits high elevations (over 7,500 feet) and depends primarily on spruce-fir vegetation for both food and cover. The other inhabits low elevations (below 6,800 feet) and uses the willow and surrounding lodgepole pine occurring along the major drainages emptying into Hebgen Lake and the Madison River. Each of these herds comprises approximately one-fourth of the animals in the area.

The third herd winters at lower elevations and spends the summer in upland coniferous forests. During all seasons, the spruce-fir and willow in this general area receive more use than the proportion of the overall vegetation they comprise.

SEASONAL MOVEMENTS

An interesting phase of this study was the investigation of seasonal movements and home ranges of individual moose in the lower Gallatin area. Moose were immobilized with a tranquilizer gun fired from a helicopter and then fitted with collars containing miniature radio transmitters. By using the transmitters to track moose, seasonal home range size, important habitat components and distances moved between these seasonal ranges were determined.

Moose in this area basically occupy two seasonal home ranges, one from late spring through fall and the other during winter and early spring. Both seasonal ranges are limited in size—usually less than 1½ square miles—although winter and summer ranges of migratory animals are sometimes separated by several miles. These findings agree with studies in other parts of Montana, Wyoming, Minnesota and other areas.

One bull, radio tracked for three winters and two summers, used the same general summer and winter ranges in successive years. In fact, during late winter of three consecutive years, he used the same dense, small (approximately 15 acres) spruce-fir patch and the immediately surrounding lodgepole pine. Summer and winter ranges of this bull were separated by approximately two miles, while those of other animals marked in this study were eight to ten miles apart. Moose marked on winter ranges in Idaho and subsequently observed during summer and/or fall in the Centennial Valley and Hebgen Lake areas of Montana have moved as much as 50 miles from the marking point. Movements between seasonal ranges appear to be relatively direct and accomplished rapidly.

Movements of bulls during the fall rutting season increase, but with no apparent pattern. Other studies report similar findings, the bulls apparently wandering widely in search of cows receptive to their amorous advances. Once the rut ends, these bulls return to their usual ranges, and resume their relatively sedentary behavior.

HOME RANGES

Researchers have also found that once moose establish seasonal home ranges (probably as yearlings), they return to them in subsequent years. This was most vividly demonstrated by the bull mentioned above, but it also held true with many other animals. Studies in Canada, Idaho, Wyoming, Minnesota and Alaska also concur. The Alaskan study suggested that moose follow stereotyped, circular migration paths for over a year.

It has been suggested that ecological conditions and population pressures (competition between moose, etc.) probably govern movements and home range size of moose. However, a Canadian study showed that marked moose did not move into an area where population pressure was reduced (through heavy hunter removal) from an adjacent area having greater population pressures (relatively unhunted). This suggests that tradition probably influences movements of individuals more than population pressures, although such pressures may be important during establishment of seasonal home ranges.

FOOD HABITS

Study of moose food habits in Montana has included examination of over 200 rumen (stomach) samples and tabulation of over 170,000 individual instances of use (bites) on various food plants, in several Montana areas.

Moose feed in winter primarily by browsing accessible stems of both deciduous and coniferous shrubs and trees. Large branches are occasionally broken off to reach desired browse. In summer, leaves are stripped from the stems of deciduous trees and shrubs. The moose's large, fleshy upper lip proves to be a very useful

adaptation for this task. They take grass and grass-like plants (sedges, rushes, etc.) and herbaceous vegetation (forbs) by grazing. When these plants begin growing in early spring, one can occasionally see a moose down on its front "knees" in a prayerful attitude, to reach this welcome change from a steady browse diet.

"Handsome it's not, but this largest member of the deer family to be found in Montana is well adapted to its environment."

Fall food habits of moose in the Montana study areas ranged from 85 to 99 per cent browse, 1 to 15 per cent forbs and 0 to 8 per cent grass and grass-like plants.

In winter, moose depended almost totally on browse (97 to 99+ per cent), with the remainder primarily dried forbs available above the snow. An exception was noted in 10 rumen samples from animals taken in a special season in the upper Big Hole area in January 1967, conducted to alleviate moose damage to haystacks. In these samples, browse formed about 75 per cent of the diet, primarily various species of willow. The remainder was grass and grass-like plants, most or all of which probably came from haystacks since such plants were generally unavailable because of snow depth.

Depending on the area, spring foods include 75 to 95 per cent browse, 2 to 20 per cent forbs and 1 to 10 per cent grass and grass-like plants.

Summer foods included 65 to 98 per cent browse, 2 to 35 per cent forbs and 0 to 1 per cent grass and grass-like plants. An exception to this trend occurred in the upper Ruby River area in the summer of 1958 when browse formed approximately 30 per cent and forbs approximately 70 per cent of the diet. Although some bias in sampling was invloved (concentrating on a few animals in a small area), moose seemed to prefer forbs in wet summers (as in 1958) when these plants may be more abundant and remain succulent longer. In the two succeeding summers (1959 and 1960) which were considerably drier, browse (mainly willow) was the preferred summer food.

Mention moose and most people visualize a big bull belly-deep in a pond feeding on water lilies or other succulent aquatic vegetation. Aquatic plants are important summer foods in many areas, but various studies show they are unimportant to Shiras moose throughout their range.

Limited availability appears to account for the low use of aquatics by Shiras moose, but it has been suggested that they may receive little use where abundant willow browse is available in summer. This is possibly related to the efficiency with which moose can strip leaves from willows as opposed to feeding in shallow water. Habit may also contribute to low use of aquatic plants.

Shiras moose are largely dependent on willow browse during most of the year. However, other browse species assume importance where willow is of limited availability. Depending on the area, seasonably important browse species might include serviceberry, red dogwood, aspen, huckleberry, birch, alpine fir, Douglas-fir and others. Fireweed and sticky geranium are the most used forbs, although dried thistles are frequently taken in fall and early winter, prior to being covered by snow.

Evaluation of important browse species on critical moose winter ranges indicates that many of these ranges receive chronic overuse in all but the most open winters. This has not resulted in any large-scale starvation losses in recent years but it has been an important factor in population regulation.

LAND USE AND WINTER RANGE

Many land use practices on critical winter ranges can be detrimental to moose. Damage has primarily occurred on private land, although some public lands have also been affected. These detrimental actions are accelerating. For example:

- Human encroachment (housing developments, etc.) onto important foothill winter ranges and critical willow bottom areas increases yearly.
- Snowmobile use in and around important moose wintering areas, especially in willow bottom areas along major streams, is growing so rapidly that regulation may be necessary in at least some areas.

Some agricultural practices also result in shrinking winter range:

- using willow bottom areas as winter pasture or feeding areas for livestock,
- clearing of willow bottoms (bulldozing, herbicide spraying, burning, etc., singly or in combination) to provide more grazing or crop land,
- improper livestock management, which can result in long-term damage to willow bottom areas and
- "accidental" spraying of willow and aspen during sagebrush spray projects (more likely due to indifference, spraying when wind exceeds allowable levels, or the fact that it is troublesome to try to avoid scattered small patches or narrow strips of these shrub and tree species).

Proper management and perpetuation of moose is directly dependent on proper land use practices on critical winter ranges. Land management should include provisions for increasing the amount of suitable winter range or rejuvenating deteriorated portions of these ranges and should be directed toward those practices which increase production of palatable browse species. For example, cutting deciduous tree and shrub species and controlled burning both stimulate sprouting of many important moose food plants. Such management must include control of the number of moose and other big game animals using the area, as well as livestock

continued

control. (This is also one area in which sportsmens' groups could provide volunteer labor and keep costs down. Volunteers would see the fruits of their labors in one or two growing seasons.)

TIMBER HARVEST

Another management area that has sparked its share of debate over the years is timber harvest. It has often been touted as beneficial to big game, including moose. However, the location, size of cutting unit, cutting system employed and timber type in which cutting occurs all help determine if the logging benefits or damages big game in the area. Elevation, slope and exposure determine the amount of potential big game winter range created by logging in Montana and other mountainous areas. Except for some possible areas in extreme western or northwestern Montana, logging has created very little additional moose winter range in Montana. In addition, roads associated with logging increase human activity in an area and provide snowmobile access in winter when moose are in poorest shape and restricted by deep snows.

Study of logged and adjacent unlogged areas in the lower Gallatin revealed that uncut spruce-fir timber received 3 to 4 times more use than recently cut (5 to 6 years) spruce-fir, or older lodgepole pine cuts (14 to 21 years). Uncut lodgepole pine received even less use, while no use of recently cut (2 years old or less) lodgepole pine was recorded. Use of recently cut spruce-fir apparently is related to the high use of surrounding uncut spruce-fir. Use of lodgepole pine dropped to zero following cutting, and did not increase until lodgepole pine reached a height where it provided adequate cover. Extensive cutting of spruce-fir can be doubly detrimental to moose since it is replaced by lodgepole pine in large portions of the moose ranges in southwestern Montana.

AGE DISTRIBUTION

Another important aspect of the recently completed study was determination of age distribution of harvested moose, and reproductive success of various aged females. Moose hunters were asked to return lower jaws and female reproductive tracts from harvested animals. The return of over 1,300 lower jaws and over 400 female reproductive tracts represents excellent cooperation from hunters, without whose help these portions of the study could not have been completed. Examination of these specimens provided a wealth of useful management information.

For example, lower jaw collections revealed that yearlings (1) comprised approximately 20 per cent of the harvest older than calves and (2) were taken in the same proportion as they occurred in the population. This figure (20 per cent) was also determined to be the percentage of the fall population that can be removed without diminishing the base herd. Since studies in other well-managed herds have shown that yearlings are more vulnerable to hunting than any other age, this also indicates that hunting, as currently managed in Montana, is removing less than the annual increment added by yearlings entering the adult population. Many Montana areas could probably support higher harvests without decline in total numbers.

REPRODUCTIVE SUCCESS

Female reproductive tract examinations showed that moose in southwestern Montana do not breed in their first fall, which is true wherever moose reproduction has been studied. Among cows older than calves, regional and even local variation exists in the age at which reproduction first becomes possible. A study in British Columbia concluded that moose in that area breed first as two-year-olds, while all other studies have reported at least some yearling cow breeding. Montana statistics on breeding incidence among yearlings compare favorably with findings from other areas, indicating that this age class is as productive as those elsewhere. Similar statistics from the adult segment of the female population also indicate that Shiras moose in Montana are as productive as their counterparts in most other areas studied.

The question then arises: Why do Shiras moose in some areas produce a lower percentage of calves, and also a smaller percentage of twin calves, than moose populations in other areas? The cow's nutrition during gestation, primarily inadequate winter nutrition, appears to contribute to a substantial loss of very young calves in many parts of Montana. Similar calf losses have been suggested for moose elsewhere, and experimentally demonstrated with white-tailed deer.

Doe deer receiving low protein diets lost as many as 42 per cent of their fawns to malnutrition in one study, while their well-fed counterparts lost none. Another study, in which high quality rations were fed in spring following low quality winter diets, still resulted in loss of over one-third of the fawns. Most young are probably born alive, but may be too weak to rise or nurse, too small to reach the cow's udder, or the cow may lack sufficient milk. Where size differences occur between twins, an unequal division of nutrients may occur. This is nature's way of enabling one twin to survive where the probability of both surviving is remote.

Other mortality factors (such as predation, accidents, parasites and diseases) affect populations minimally. Therefore malnutrition losses, either direct (starvation) or indirect (lower incidence of yearling cows breeding, lowered pregnancy and twinning rates among adult cows and increased postnatal calf losses) would probably rise if hunting stopped. Hunting, therefore, serves a useful purpose in maintaining healthy, productive moose herds and helps to prevent overuse of moose habitat.

The moose might not be handsome, but fortunately ugly is only skin deep and this animal provides fine flavor on the table.

dear F&G

Slogan Takes A Beating

The other night, we were sitting around the kitchen table lamenting the plight of the environment when we struck upon the subject of environmental slogans. Immediately coming to mind, of course, was that venerable old classic solemnly uttered by an animated, Madison-Avenue-conceived bruin, tastefully attired in long pants and ranger hat and firmly gripping a shovel, which everyone knew he would use instantly on anyone not heeding his wise advice: "Remember, only YOU can prevent forest fires."

For 30 years this widely proclaimed warning, parroted by Smokey the Bear, served the objectives of the National Cooperative Forest Fire Prevention Program and its parent, the U.S. Forest Service. It was widely and unquestionably accepted as the eleventh commandment of forest management. Ironically, the Forest Service has since determined that not all fires are harmful and indeed that natural fires may be important to forest succession and maintenance of wildlife habitat.

A slogan can be a powerful and far-reaching tool in selling a simple idea. It is often remembered long past anything else an agency may say or do. It must be chosen with great care to coincide as precisely as possible with the goals and intentions of its sponsor. And because of their brevity, slogans can easily be misinterpreted.

Take for example the Department of Fish and Game slogan: "A livable environment for wildlife is a quality environment for man." Although long as slogans go—compare with "Give a hoot, don't pollute" and "Save gas, don't pass"—it attempts to explain a very complex situation in relatively few words. This can be misleading.

For example, we're disturbed that our Department of Fish and Game will settle for anything less than a quality environment for the wildlife in its trust. Somehow, we like to think of Montana as unique, another rung or two up the ladder. Montana still has quality wildlife habitat in abundance. Why settle for less?

Probably most important, the slogan infers that wild animals and people can inhabit the same environment and coexist. This deserves further comment.

For some time now *Montana Outdoors* has published provocative articles on the manner in which rural subdivisions have been occupying wildlife range and influencing wildlife behavior. The people lured to the wilds unwittingly destroy the values they seek as well as the wildlife, yet your slogan appears to invite the occupation of quality wildlife habitat by people.

Twentieth-century man, in carrying his affluence and comforts to the country, is clearly not compatible with wildlife as the Fish and Game slogan might be interpreted. In effect, the slogan can be misinterpreted to condone this exodus into the countryside and the transformation of once quality wildlife habitat into merely livable habitat. Not only does this migration from the cities conflict with wildlife production, it also conflicts with the production of needed food on Montana's agricultural land, and diminishes the natural beauty and diversity of our state.

Recognition of these facts should lead to the concept of three general land classes: open space, green space and living space. Open spaces—national forests, parks, wildernesses and refuges—are areas set aside for maintaining the integrity of essentially natural ecosystems. Here man is only a visitor and here survives some of the best wildlife habitat. Green spaces, such as fields, rangeland and commercial forests, are used for production of food and fiber. With proper management, these lands can also attract and support wildlife. Living spaces are the historical residences of man, the cities, towns, and villages where services should be efficiently concentrated so as not to diminish the support capability of open and green space. Except for a few small birds and mammals, man's living spaces provide relatively poor habitat for wildlife.

Many people lose sight of the fact that the city, the traditional environment of man, can also be an attractive, quality environment in spite of the fact that it is not suited for wildlife. Instead, people may tend to think, as the slogan suggests, that a quality environment means a 10-acre ranchette in the valley, a lot on the lake or a home in the foothills. Obviously not everyone can or should live in these rural "quality environments." If everyone insisted on doing so, we would have little remaining open space and green space and our cities and wildlife would suffer. Yet this is seemingly what the slogan is inviting.

Does the department mean what it says? Do you wish to continue to promote the idea of man and wildlife living side by side in the same environment? What is your concept of a quality environment? For man? For wildlife? Are you in the business of maintaining a quality habitat for wildlife or one suitable for existence, i.e., livable?

We leave you with our suggestions. First, a replacement slogan—simply, "A quality environment for wildlife." After all, this is what habitat preservation and restoration is all about. Secondly, in recognition of the complex relationship between man and wildlife, perhaps a detailed position statement would be more appropriate than a slogan. It may help clarify the department's stand in this area and put to rest our confusion and misunderstanding generated by your present slogan.—*Loren Bahls, Frank Culver; Helena, Mont.*

DOLLY VARDEN WINS SCIENCE FAIR CONTEST

Thank you for all of the things that you sent me about the Montana state fish. Everone who saw my Science Fair project was very interested in helping name it. All together 131 people voted.

Here are the results: Dolly Varden, 43; rainbow trout, 35; paddlefish, 24; grayling, 16; whitefish, 6; lake trout, 3; sturgeon, 2 and cutthroat trout and sauger, each 1.—*Adam Del Torto; Great Falls, Mont.*

• *To compare Adam's results with MO's, see the July/August 1974 Catchall. His additional ballots would have given Dolly Varden the edge, closely followed by our winner, grayling.* —Ed.

SPRINGBOARD

"I am in favor of cutting the wild lands into parcels, so that every poor man may have a home."—*Abraham Lincoln, in endorsing the Homestead Act*

". . . by its nature, technology is a system for manufacturing the need for more technology. When this is combined with an economic system whose major goal is growth, the result is a society in which conspicuous production of garbage is the highest social virture." *William Murdoch, Joseph Connell, from the National Wildlife Federation's* Consevation News

FOR DISCUSSION

THE LAND'S BEAUTY

I deplore strip mining. I have lived all my life in Pennsylvania and have seen the results. A buck sure means a lot to some people. They fail to see the beauty in this land of ours. When it's gone, we'll have nothing to fall back on, except our rear ends.

In the past two years, I have made four trips west—three to Montana and one to Washington. I have never seen anything as beautiful as this country. I sometimes forget that I'm out there to hunt and instead spend my time taking pictures with my 35mm.

I will have the pictures long after the land has been destroyed and it's gone.—*Ray L. Reck; Bedminster, N.J.*

HE'LL VOLUNTEER—WITH REFERENCES

Your Jan./Feb. 1974 article on subdividing as it relates to Montana gave me a thrill. It renewed hope that as long as there are people like yourself around who, despite hell or high water, will tell it like it is—there is then hope for an otherwise doomed sanctuary of what so little remains today—natural landscape.

Planned building with environmental safeguards included can be accomplished provided the "land promoter" becomes a "land developer." I like to think (after running from "promoters" and the polluting effects of people and their effect on resources) that we have found a sanctuary here in Montana. A man can still be his own man and tell the truth, even if it hurts and particularly when he knows his action puts him on a collision course with the money-crazed carrion crow in the field subdividing the land for a profit.

Why my concern? Well, if it is possible, obtain a copy of *Audubon* (May/June 1968), turn to page 30 and read the article dealing with "Great Lakes, Great Mess." Then you will understand, especially when the writer and his father fished in the Little Calumet River a little over 50 years ago and caught many bluegill, perch and other species. Today you could refine the crude that flows in that river into many different kinds of heating and lubricating oils.

In Wisconsin where I initially retired, a character by the name of Isaacson found our remote and practically undisturbed area, bought about 3,000 acres of prime sand rock and cockleburs and ran a bulldozer through the stand of trees in a winding fashion. Since the area was about 90 miles from St. Paul/Minneapolis, he sold lots for summer home sites. He tore up all the game trails, put septic tanks in areas where we historically had spring high water run-offs and in general raped with abandon. As a result of my remonstrances, I became a defendant in a $1 million law suit.

The story of Florida is well known. In the nine months I lived there, it got worse. My wife and I are through running. We liked what we saw when we arrived here about a year ago. Although pollution and "land rapers" have already found the area, there seems to be hope if someone with enough wind makes the right sounds with his horn.

We are at the end of the trail and there is no place after Montana. All of us have to start with what is left to save. No more "Big Skies" or any of the other aliases for Shangri La used by the land peddlers.

As I already mentioned, I am not adverse to sinking my teeth into anybody's backside who threatens our environmental future, so if you have need for a volunteer who can furnish the best of references and has already adopted Montana, call me.—*Harold "Cy" Mendelsohn; Lakeside, Mont.*

ARTICLE DESIGNED TO ELICIT RESPONSE

"The Subdividers are Still Here," in the May/June 1974 *Montana Outdoors*, was certainly designed to elicit a response from your readers. I do indeed feel responsive, although perhaps not in the way you intended.

Many of us here in West Yellowstone who share an interest in wildlife, environment and certainly the fish and game, wonder just how closely you have studied the proposed development at Ski Yellowstone. Your article would have one believe it is situated where it encroaches on near wilderness when in actuality the residences would be situated on private ground adjacent to a highway.

Further, it is surprising to find a magazine published with public funds admonishing citizens of the state to get on a would-be bandwagon objecting to a fine development "before it is too late." That's hardly designed to be fair.

I wonder how you and your editorial staff finds justification for such antipublicity for developments with so little discussion, research and honest information presented to your reading public.—*Janice R. Dunbar; West Yellowstone, Mont.*

REPLACING GAME WITH PEOPLE DOESN'T MAKE SENSE

Congratulations for pointing out the menace of uncontrolled subdivision. It's time people in your department faced this threat to wildlife, which can eventually do more damage to game populations than any other factor.

We have lost thousands of acres of game habitat in the Flathead Valley to subdividers in the last few years. And it's a permanent loss. Regardless of the length of hunting seasons or other types of controls your department imposes, if the winter range is gone, so are the animals.

I'm sure you will receive criticism because of this article. But please consider the sources. I'm willing to bet that almost all of that criticism comes from those individuals and organizations who see dollar signs in the shambles of uncontrolled subdivision. A "boom and bust" cycle in an area's economy makes some people rich. Please recognize the vested interests behind the screams of "Foul," directed your way.

Compare this with the results of the attitudinal survey conducted in the Flathead. Nearly 70 per cent of those returning questionnaires indicated that people were moving into the Valley too fast. Believe me when I say that you have the majority of the residents of the Flathead supporting you.

It is hard to see the logic behind the idea that we must replace game with people—in order to make Montana a better place to live.—*John R. Gibson; Bigfork, Mont.*

POOR LAND USE COSTS PLENTY

I have followed your coverage of land development problems in the last several issues of *Montana Outdoors* and after reading the May/June 1974 issue, I just had to write and tell you what a great job I think you are doing. Some of the points condemning your coverage are full of the same crackpot scare tactics that we have been hearing around here for years.

Fortunately, although belatedly, the people in Minnesota are waking up to the problems of subdividing and poor land use and are realizing that these practices are costing them *plenty*. Not just costing them "a few deer" or "some fish" or "some trees" (which are darned important in their own right), but are taxing the people heavily in loss of *their* environment and their *money*. It won't take long for any intelligent person to realize the extra burdens these developments put on taxpayers for such things as more roads, more schools, more congestion, more this, more that.

The people of Montana are truly fortunate in that you have a chance to do something to plan and control development *before* you lose what you can't replace.—*John S. Dale; Mound, Minn.*

LET'S GIVE 'EM SCENERY

Montana is a wild and beautiful state, but for how long? How long can we subdivide and bisect these mountain blocks (for example, Big Sky of Bozeman) before it is too late? Industrialize? Develop? To keep people in Montana? What do we want, another California? Big cities? No!

I think it is about time this state opened its eyes. I believe the state of Oregon has a motto, "Travel through, enjoy the scenery, but don't stop."

Let us be a little primitive, a little backward, but keep what we have. That is what the people from these developed states come here to look for. Let's give them that!

We don't want to drive to all the mountain tops or sleep in big luxury hotels. You are doing the right thing; keep up the good work and don't let this bureaucracy tell you any differently.—*Leonard J. Heikkinen; Anaconda, Mont.*

editorial

the sulfur myth

The Northern Plains states have been barraged with propaganda to make us believe our coal must be developed to save the rest of the country from sulfur oxide pollution. The *factual evidence* is in flat contradiction to this rationale.

A recent federal Environmental Protection Agency study determined that it is *cheaper* for both existing and new power plants in the Midwest and East to use their own sources of coal and remove the sulfur at the stack with scrubbing devices than to burn low sulfur western coal. Our coal may have a low sulfur content, but it also has a low-grade heat value and the shipping costs are exorbitant. Transportation from the west costs between 44-55 cents per million BTU. Desulfurization techniques for eastern medium and high sulfur coal cost between 23-32 cents per million BTU.

Desulfurization technology has only been perfected in the last few years. Four scrubber operations have finally gotten "the bugs" worked out: two in Japan, one each at plants owned by Boston Edison and Louisville Gas and Electric Co.

Many parties in the east are already aware of the "sulfur myth." The Illinois Power Co. has testified that they have no intention of switching to western coal: The cost increment for their company would be 300 per cent. The Indiana Public Service Co. has stated that the cost per ton for transportation of western coal ALONE exceeds the entire price per ton for eastern coal—including transportation and delivery. The West Virginia Air Pollution Control Administration figures that, at one large plant, a savings of $11 million a year could be achieved by using eastern coal and desulfurization equipment rather than western coal.

The coal industry's real motive in moving west is that *huge* blocks of federally owned coal are available. To invest in coal in the eastern or central states, they would have to buy up coal rights held by many owners.

The industry is also running away from labor and health and safety problems. They have stripped about all they can strip in the east. In many states, strippable reserves will be exhausted in the next decade. Eastern coal mining would then have to go back underground and the industry would have to face up to developing a safe and efficient underground technology.

How the coal industry can afford to ignore the steep transportation costs associated with western coal is explained by two things: (1) Free enterprise competition is not really a factor in the coal industry's economic decisions. Just 13 big companies (many of them oil companies) control more than 60 per cent of the country's annual coal production. (2) Most utilities (which also have no natural competition to force them to buy the cheapest source of fuel) are allowed to pass on fuel transportation costs to the consumer *without* any public rate hearings required. (from "Facts About Coal in the U.S.," Environmental Policy Center; Washington, D.C., 1974)

The long-range strategy of the large coal and oil companies moving west is likely to be to squeeze out their eastern competition. If the 13 companies with controlling interest in U.S. coal production

continued

come west, the market for eastern coal will dry up. All the diverse eastern coal owners will eventually be forced to sell their reserves—to western mining interests. The potential for an energy monopoly is frightening: a few "energy companies" controlling domestic oil reserves and both eastern and western coal supplies.—*reprinted from* The Plains Truth, *May 1974*

the outfitter's obligation

In 1903, Montana lawmakers required all guides to buy a license ($10) and keep records—names and addresses of clients, what and how much game was taken and where it was taken. This first law also forced the outfitter to accompany his client in the field and contained an equal responsibility clause which made the guide equally responsible for game law violations by his client. (A game law violation meant revocation of his guide license.)

So, outfitters have had some basic responsibilities for 50 years. Since then, regulations governing this industry have been periodically revised and altered.

But the outfitter has another obligation, a responsibility that can't be written in statutory law. It's to tell his client(s) there's much more involved than killing a bull elk or landing a lunker brown trout. Every guide should make an effort to inject some total resource conservation into campfire discussions. He should let the client know that the trophy he seeks wouldn't be there if it weren't for a quality wildlife habitat.

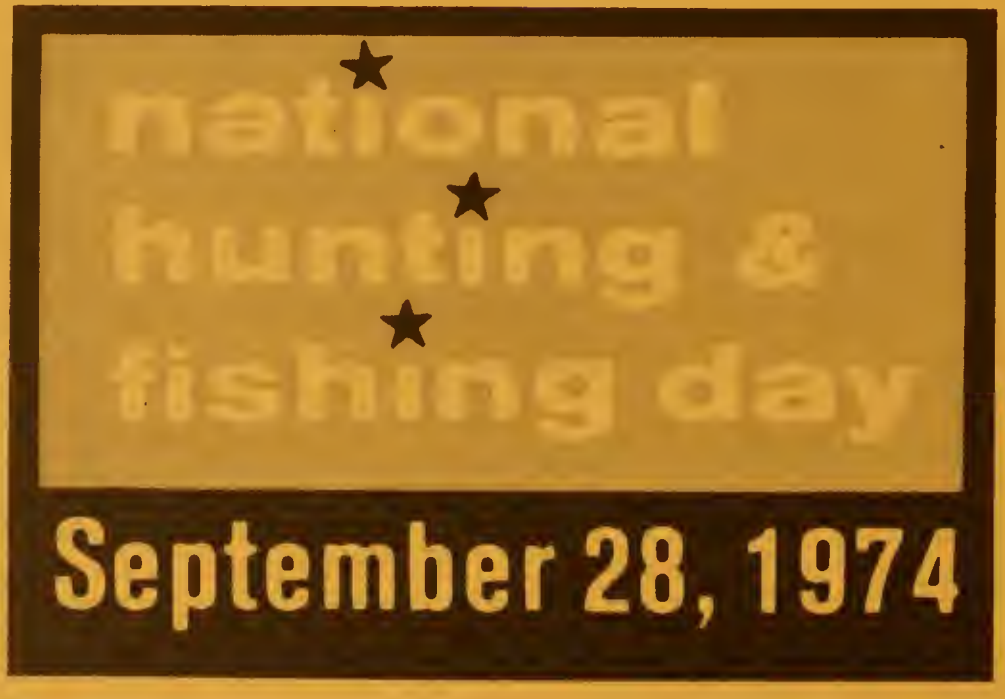
If he's a hunter, tell him there's much more to hunting than killing. If he's an angler tell him fishing depends on clean (and often free-flowing) water. And, if he expects to enjoy these activities again, he must join the movement to protect and maintain a quality fish and wildlife habitat across the nation. He should tell the sportsman that when he sees that bull elk through his scope, he's looking at much more than a trophy. He's seeing the product and indicator of a clean environment.

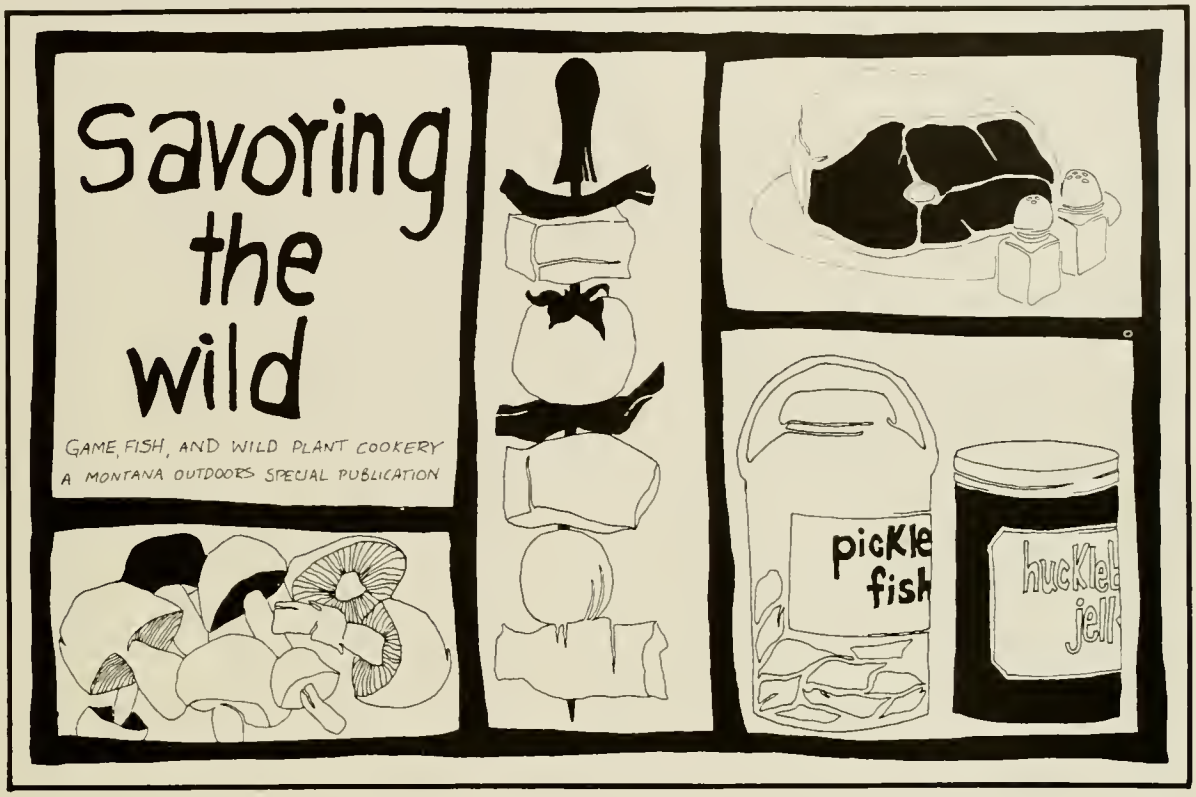
Believe me, it's the professional thing to do.—*Bill Schneider*

hunting rustlers

We have a suggestion for the many hunters who wish to improve relations with ranchers.

While hunting—and at any other time of the year, for that matter—quickly report any suspicious activities that could mean rustling. Montana's ranching industry loses thousands of dollars every year to this illegal practice. Helping with a rustler's apprehension might give a landowner a good reason to appreciate hunters on his land.—*Bill Schneider*





OF ALL THE ENJOYABLE ASPECTS OF HUNTING, FISHING OR HIKING IN THE GREAT MONTANA OUTDOORS, PROBABLY ONE OF THE MOST REWARDING IS FINALLY SITTING DOWN TO A DELECTABLE MEAL PREPARED FROM THE GAME OR WILD PLANTS YOU BROUGHT HOME FROM THE WOODS. WE HAVE A COOKBOOK THAT MIGHT HELP YOU ENJOY THOSE REWARDS IN SOME NEW WAYS. IT'S CALLED "SAUORING THE WILD" AND WE THINK IT WILL HELP YOU TO DO JUST THAT.

WHAT CAN YOU EXPECT IN THE WAY OF RECIPES? HOW ABOUT SUCH GOODIES AS BARBECUED RIBS, HAWAIIAN HAMBURGERS, CHINESE HASH, CHILI, ROSE HIPS JELLY, TROUT WITH ALMONDS, TERIYAKI PHEASANT, SWEET AND SOUR GROUSE AND RABBIT PIE, TO NAME A FEW.

BUT, IT INCLUDES A LOT MORE THAN JUST SOME PALATE-PLEASING RECIPES. IT CONTAINS AN INFORMATIVE AND DETAILED DESCRIPTION OF METHODS USED TO INSURE THAT BIG GAME MEAT IS NOT JUST MEAT, BUT GOOD MEAT. IT TELLS YOU HOW TO TAKE CARE OF FISH IN THE FIELD SO YOU DON'T END UP WITH A SOGGY MESS IN THE BOTTOM OF YOUR CREEL; HOW TO PRESERVE MUSHROOMS, HOW TO MAKE JERKY IN SEVERAL WAYS, HOW TO CAN AND CORN WILD GAME AND HOW TO PREPARE SALAMI AND MINCEMEAT.

SUBSCRIBE TO MONTANA OUTDOORS FOR THREE YEARS OR MORE AND THE COOKBOOK IS YOURS--FREE. IF YOU GIVE SOMEONE A GIFT SUBSCRIPTION FOR THREE YEARS OR MORE, BOTH OF YOU WILL RECEIVE THE COOKBOOK. PLEASE USE THE HANDY INSERT IN THIS MAGAZINE TO ORDER

Making Molehills

FLATHEAD COAL DEVELOPMENT

By Bill Schneider

(Left) Kaiser Resources coal mine about 30 miles north of Fernie, British Columbia. This is exactly—only at a slightly smaller scale—what will happen to two mountains just north of the Montana border. (Below) One of the mountains destined to become a molehill. Presently, exploration crews are bulldozing roads on the mine site and taking samples for detailed testing. F&G photos by Bill Schneider

Out Of Mountains

If a Kalispell or Whitefish resident heard someone say two nearby mountains would soon be moved to Japan, he'd most likely have a good laugh.

But if he listened a bit longer, he'd find that it's no laughing matter because that's exactly what could happen in the next few years in the Flathead Valley just north of the U.S. border.

Here, only eight miles into British Columbia along the North Fork of the Flathead River which forms the west boundary of Glacier National Park, a giant mining company plans to remove high-grade coking coal from two "hills," clean it on the mine site and then ship it to Japan. In addition to the actual mining, the proposal could bring a new town, a railroad, a blacktop highway, power lines and perhaps a natural gas line to what is now a semi-primitive, undeveloped, unpopulated region.

Recently, we visited the mine site and discussed the development at length with Brian Pewsey, the mining engineer in charge of the project. (Pewsey works for Rio Algom Mines Ltd., one of the—if not *the*—largest industrial complexes in the United Kingdom. Sage Creek Coal Ltd. will actually mine the

continued

North Fork site. Sage Creek is, in turn, jointly owned by Rio Algom, Pan Ocean Oil and several U.S. investors.)

The trip was instigated by "rumors" sifting down across the border, which, in turn, prompted many inquiries—people were worried about the Flathead. A firsthand inspection of the situation substantiated the rumors, but left a great many "ifs" about the development's effect on the Flathead.

Perhaps the greatest cause for concern stems from the threat of chemical pollution of the North Fork, into the main Flathead River, and perhaps even Flathead Lake. The very thought of losing most of the Flathead River system to the indescribable ugliness of acid mine drainage makes Montanans—and especially those fortunate enough to enjoy the region—shudder.

Questioned about this, Pewsey assured us there would be "no chemical pollution associated with this at all." He also said there was "no acid in either the coal or the overburden."

If this holds true, Montana may be spared the total obscenity of the acid streams that flow through strip mined areas in much of the eastern and central U.S. This type of pollution obliterates every life form and makes the water unfit for any human use.

Again, however, Pewsey tells Montanans not to worry. "There is no way we could go ahead with this if we thought we would make a mess of it. We couldn't afford it."

Dr. J.D. McDonald, senior reclamation inspector for the B.C. Department of Mines and Petroleum Resources, agrees with Pewsey's optimism. In a letter to a Missoulian reporter, he said, "The Government of British Columbia is vitally concerned in developing our mineral and coal resources in a manner which takes into consideration all aspects of environmental control."

He also said two open pit mines are operating in the Elk Valley (just northwest of the Flathead Valley). "There have been strict terms and conditions applied to these operations and we have resolved most of the problems and have maintained water quality in the Elk River.

"I can appreciate your concern over the Flathead River and valley as it is such a beautiful area. We feel that there are proper safeguards to protect the environment and maintain water quality and still mine the coal," McDonald continued.

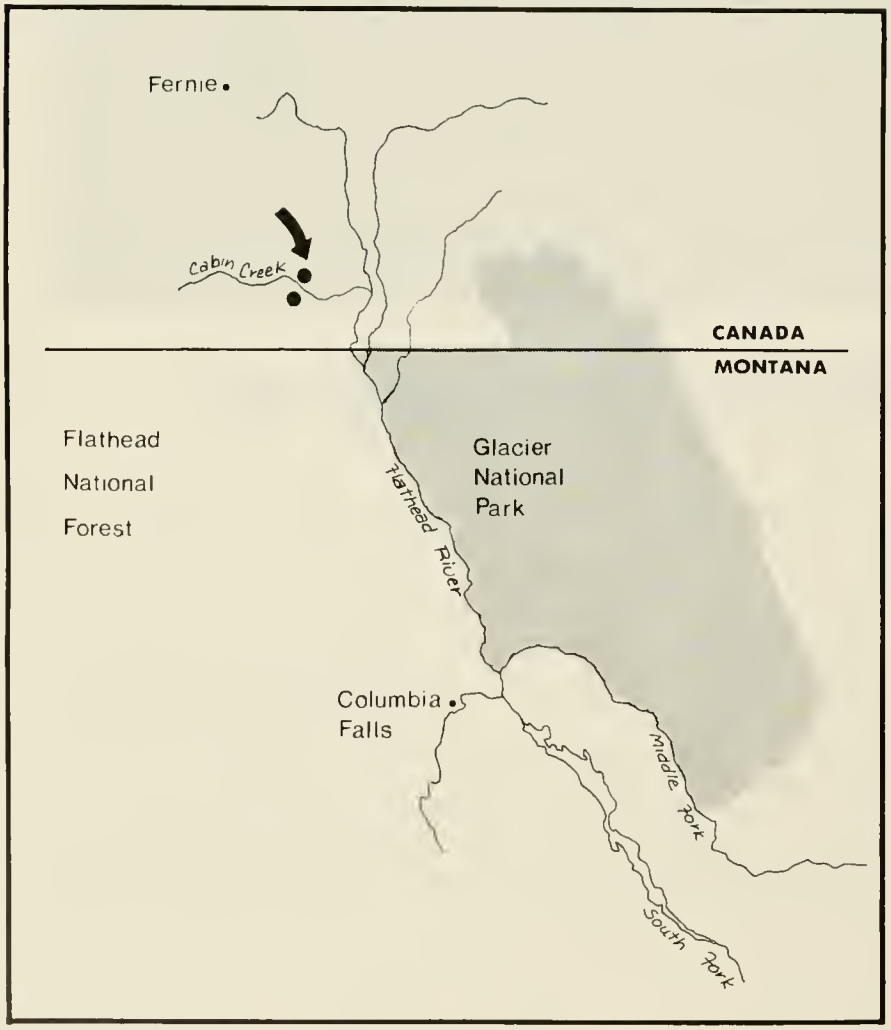
Even if chemical pollutants never enter the Flathead drainage, the massive mining project promises to dramatically alter the area, its life style, natural attractions and resources. Regardless of the merit of the coming of "progress" to this remote region, the North Fork area that local residents know and love could cease to exist.

The mine site lies directly on Cabin Creek, a major tributary to the North Fork. Two hills, one on each side of the creek, will, in essence, disappear from the face of the earth. Each hill contains three coal seams, lying at a 20-30° angle.

The mining method is technically not "strip mining," according to Pewsey, who seemed to be open and honest in volunteering information. The mining engineer prefers not to label it "strip" mining, but rather "pit" mining.

This pit mining differs from contour strip mining—the method widely used in Appalachia—because the overburden is hauled away instead of pushed down the hillside. In Appalachia, coal seams usually lie horizontally, instead of at an angle. After a hill

The approximate location of the proposed open pit coal mine. illustration by Donita Eaton



has been contour mined, it has a "ring" completely around it or a flat bench that follows the "contour" of one or more hills. At the Cabin Creek mine, however, the hills will, in effect, vanish—thus, the difference.

After the coal is removed from the hills, it will go to a nearby processing plant for cleaning and washing. Impurities are removed and the coal begins its long journey to a Japanese steel mill. The water and noncoal solids go to a "filter press" where the water is "pressed out" and then recycled. The solids go to "a safe place," in Pewsey's words. "It's a completely closed system," he said.

The mining engineer thinks coal removal will have minimal physical impact on Cabin Creek, and in turn, the North Fork, "We won't allow overburden to get closer than 600 feet from the stream." But he concedes the company can do little about natural runoff, which will, no doubt, wash some overburden (and chemicals contained therein) into the stream.

The two hills hold 60 million tons of high quality metallurgical (or coking) bituminous coal. In fact, it runs about 14,500 BTU per pound, while eastern Montana coal usually falls shy of 10,000 BTU. Also, this coal sells for $26-30 per ton; eastern Montana coal goes for less than $4 per ton. However, like Montana deposits, this coal has a low sulfur content—less than 1 per cent. Low sulfur content lessens the chance of acid mine drainage since sulfur washed into streams reacts with water and forms sulfuric acid.

When asked about land reclamation, Pewsey said his company was "bound by law to reclaim the land." He said his company must save the topsoil, cover the mined area with it after mining and then completely revegetate the site.

"B.C. has a very stringent law," he noted. "When we read it, we shudder."

We asked what "completely revegetate" meant. He replied, "Whatever will grow there—grass or whatever."

This brings us back to the department position on coal stripping in eastern Montana. (See the four-part coal series, beginning in the Jan./Feb. 1973 *Montana Outdoors.*) The department feels "successful reclamation" means much more than merely covering the land with anything that grows. To us, it means replacing—and *re-establishing*—the original, diverse vegetation.

But the physical act of removing the coal represents only one part of this proposal. As in similar situations, we unearthed some discrepancies such as when all this starts. We heard the mining could begin in "about two years." But, in rebuttal, Pewsey dates it "at least six years away—at the earliest." Confirming this, McDonald says, "Any operating mine is at least three or four years away."

The two hills already bear crisscrossed scars of mining exploration. Roads switchback up both hills, and one small area has been leveled for a base camp. This exploration has already caused some serious siltation problems in the area. Landslides have already occurred, and some poorly placed roads are eroding.

Except for this and some logging activity, the region

continued

This photo illustrates the massiveness of the equipment to be used at the Cabin Creek mine. photo by Bob Gates

remains mostly undeveloped, without power or services. (Columbia Falls lies 68 miles to the south and Fernie, B.C. 53 miles to the north.)

If these mining plans become realities, this will all change. First, Pewsey feels a blacktop highway to the mine is essential. It looks like the new road will head north from the mine site. However, he said, "There is every likelihood the highway could go on both sides of the border."

As with the highway, the railroad that will haul the coal to the West Coast could go north or south. Rio Algom prefers to send it south. However, since the mine rests on B.C. public land (called "Crown" land), Pewsey predicts the government will want the coal sent north and then into Vancouver to be loaded on Japan-bound ships.

Dr. Sid Groff, from Montana College of Mineral Science and Technology in Butte, briefly studied Flathead coal. He concluded, "The deposit is much more readily accessible from the south . . . . "

But regardless of which way the coal goes, Pewsey foresees a "wind loss" problem. This coal exists in a "multi-fractured" or "powdery" state. It easily blows away like any powder. Unless the coal cars are covered (that's expensive!), the way west and especially the rail yards could be distinctly marked by a trail of coal dust.

As with most initial developments in undeveloped areas, the Flathead could experience some "bloom" or "boom and bust" growth. Again, we found some differences of opinion about the extent of urban growth associated with the mine. Pewsey set it at 650 full-time mine employes which will, in his opinion, generate a new town of about 3,000 (about the size of Columbia Falls). But other estimates went up to 1,000 mine workers and a town of 6-7,000 (Columbia Falls and Whitefish combined). Exact location of the town wasn't known.

MINI-EDITORIAL

Usually a major industrial development such as that proposed just north of the U.S. border on the North Fork of the Flathead River moves too rapidly for concerned citizens to properly evaluate the environmental impact. But this time, Montanans have time—at least three years.

Need we say more?

As mentioned earlier, it all comes down to a great many "ifs." For example, what would happen to the Flathead area:

- IF a new town with inadequate sewage disposal facilities sprouted directly on the banks of the North Fork just north of the border?
- IF, unknown at this time, the coal or overburden contains some damaging chemical, which reaches the river via natural runoff?
- IF a rail spur is built to the mine along the U.S. portion of the North Fork?
- IF wildlife values are adversely affected by this and possible future development north *and* south of the border?
- IF similar developments crop up just *south* of the border, where coal deposits *also* exist? (We checked with the Department of State Lands and the U.S. Forest Service. Neither knew of any activity in this region at this time.)
- IF Rio Algom or any other mining firm develops additional mines north of the border? (They control leases to a vast block of public land extending south to the border and west into the headwaters of some streams flowing into Glacier National Park.)
- IF the "coming of progress" in the form of better roads, power and related services adds to the success of large second-home subdivisions already present on private land south of the border?
- IF the North Fork is protected under the national Wild and Scenic Rivers Act? (The FS has recommended classifying the entire 58.3 miles under the act. One section of the act provides that boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property of the other side.)
- IF after the projected 20-year-life of this mine, the town, instead of "busting," searches for another reason for its existence—more coal mining, logging, recreation oriented business, copper mining, etc.?
- IF increased siltation of the North Fork drastically affects game fish and other aquatic life?

Granted there are too many "ifs" for a sound evaluation of the upcoming development—enough uncertainty to warrant careful study, *not* rapid and perhaps unwise decisions.

But these questions must be answered one way or the other—*now*, while there's still time. Fortunately, Montanans have enough time to seriously assess the possible impact of this massive mining proposal on their state—*years in advance.*

Next Time

Watch for these features in the Nov./Dec. 1974 *Montana Outdoors*:

—forest fires and wildlife
—the ling
—how seasons are set
—winter fun (MO recreation guide)

Surviving the Wilderness

By Mel Wojcik

GRADING STUDENTS HAS caused much debate in recent years. Some school officials favor percentage grades and others advocate the "pass/fail" method. To this end, someone taking a survival course receives a "number grade" in the classroom, but his real test comes when he must apply his knowledge in a real situation. Then, he either passes or fails—survives or doesn't survive. He can't "almost" survive. The student *lives* or *dies*.

Survival situations differ. Terrain, time of year, time of day, temperature, availability of water and food and all other factors must be considered. However, one can survive in rough and precipitous terrain, in midwinter, in the middle of the night at -20° with no water or food readily available, if he is mentally prepared and has carried with him a minimum of items to provide warmth, energy and shelter.

TWO REAL SURVIVAL TESTS

To illustrate, consider two survival situations—"real tests"—which occurred in Montana during the 1973 hunting season.

The first incident involved a 48-year-old man, who was elk hunting in the Garnet Range. The temperature was around 20°, but it was snowing and blowing heavily, which probably brought the wind chill factor to zero or below. All in all, it wasn't an extremely dangerous situation for a properly clothed person.

Nevertheless, the sheriff's office received a call the next morning. The elk hunter didn't return the previous evening. A search party found the man's body that same afternoon. A reconstruction of the scene of this tragedy reveals some interesting facts.

• The man's tracks indicated he was definitely lost. He circled around all night, obviously not knowing in which direction he was headed. The distance between footprints was longer than usual, indicating that he was probably running and in a state of panic. Searchers found his body on a logging road headed away from safety. Because of the circling, it was hard to determine how far he had walked and ran—probably 5-10 miles.

• He apparently hadn't tried to camp for the night or even build a fire.

Searchers found the body lying on his rifle, action open and empty. He died sometime early that morning.

• Background investigation revealed he was completely unfamiliar with his hunting area. In this instance, he was hunting alone. His companions had dropped him off the morning of the hunt, so they knew his general whereabouts.

continued

He had a chance to spend a night in the woods—a cold, miserable night, to be sure. But certainly, he need not have died.

The second incident involved a 13-year-old Missoula boy hunting elk near Philipsburg. He was a Boy Scout and truly loved the out-of-doors. He knew the lay of the land, even though it was his first hunt in this area. He didn't have a map of the area, something he usually carried. However, he was at home in the woods.

After hunting most of the day, he became a little confused about where he was. Darkness comes early in the late fall, so he knew he would have to spend the night. This wasn't his first. He and his friends had taken several overnight camping trips on their own. He built a fire and cut some boughs to sleep on. The temperature dropped below 20°, making his night rather uncomfortable, to say the least.

The next day, he discovered the way out, but ran out of time. Darkness fell again. It rained that day, and body sweat soaked his matches which he hadn't dipped in wax or carried in a waterproof container. Denied a warm fire, he found a tree with overhanging branches, cut some boughs and spent an even more uncomfortable night.

The next morning, he walked to an old farmhouse and safety. Actually, he broke some basic survival rules, but he kept his head. He didn't panic. He knew he was pitted against nature. He knew how to cope with the elements. And he survived!

S-T-O-P

Each survival situation is different, but some basic survival rules must be followed in every case. A person might try to convince himself that he isn't lost, just a little confused. What's the difference? If you're in totally unfamiliar terrain, it's getting dark and you're confused about which direction to take—you're lost. "Lost" and "confused" are the same thing. Remember that word—S-T-O-P! It spells—Stop, Think, Observe and Plan. The best survival tool is your head.

Stop and sit down. The body is designed basically to do two things, think and work. Both functions can be accomplished together, but more efficiency can be obtained if done separately. By stopping and sitting down you've readied yourself for the next step.

Think of your situation. Are you in immediate danger? Do you have a reasonably good chance to make it back to camp or are you totally lost? You may be a little uncomfortable spending the night, but it's far better than wandering around in the dark.

Observe the terrain around you and the resources available. Is firewood and drinking water available?

Plan your course of action. You've resigned yourself to spending the night. You've overcome the

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SUGGESTED ITEMS FOR A SURVIVAL KIT

1. One foot of heavy cotton string, dipped in melted paraffin and then wrapped in waxed paper. Light with match and use to start fire.

2. Salt, wrapped in foil packet.

3. Two snelled fish hooks.

4. Four feet of black plastic electrician's tape. Use to seal and waterproof cans, fasten splints, repair tears, etc.

5. Steel wool, 000-gauge or finer, makes good tinder.

6. Picture hanging wire for snares.

7. Water purification tablets.

8. Metal container, with mirror glued in lid. Use for signaling aircraft, melting snow for water or to mix up small quantities of soup.

9. Small tube of antibiotic ointment.

10. Wooden matches, dipped in paraffin to waterproof them.

11. Safety pins.

12. Packet of condensed soup mix.

13. One-per-day vitamin pills.

14. Small whistle. Use to signal.

15. Adhesive bandages.

16. 20-lb. test leader. Use for fishing, as "thread," for snares, to lash shelter together.

17. Single-edge razor blade.

18. Needle with large eye.

first and greatest obstacle in a survival situation by admitting that you're lost. The rest is easy.

You've used your head so far. Now you must use it again to provide warmth, energy, shelter and prepare for rescue.

BUILDING A FIRE

The first thing you should do is build a fire. Psychologically a fire removes some of man's basic fears—fear of the dark, fear of animals and fear of being alone. To some degree, everybody possesses these fears because fear is an inherent trait. But in reality, there is little to fear while spending the night alone out-of-doors.

You say you're not afraid of animals? You've probably been camping with friends and wandered from the light of the campfire. Maybe you heard something moving in the brush but couldn't see it. Your heart started pounding and you ran back to the security of the campfire in double time. Everybody is afraid of animals, especially when the animal is unknown and you're alone. A fire also helps remove the fear of being alone because it offers warmth and light. In a survival situation, fire also helps dry clothing, cook and signal.

Select the location for your fire carefully. Avoid building a fire under a tree because the tree might ignite or heat from the fire could melt snow on the branches and soak everything below. On dry ground, scrape the area to bare dirt. If the fire must be built on the snow, construct a platform of logs or stones against a large rock or a wall of logs to reflect the heat toward you and your shelter.

You can't start a fire by placing a match under a large piece of wood. Something easily ignited (tinder) is essential. Small twigs, bark, wood shavings, dry leaves, dead needles, pitch and tissue paper make excellent tinder. Or carry your own tinder material, such as cotton balls, 000-gauge steel wool or sawdust saturated with kerosene. If steel wool becomes wet, shake it off, fluff it and it will ignite readily from a spark. Gently blow on it, add other tinder and a fire will soon be blazing.

You can make a waterproof container for saturated sawdust or matches from empty 12- and 16-gauge plastic shotgun shells. Place the sawdust in the 16-gauge hull, cap it with the 12-gauge hull, tape the joint and seal the primer pocket with airplane glue.

Another way to start a fire is to use a rifle cartridge. Remove the bullet from the cartridge, placing most of the powder on the tinder. Leave a few powder granules in the shell. Stuff a piece of cloth into the shell and place it in the chamber of your rifle. The cloth should ignite when you shoot the shell. Place it on the powder and tinder. Don't shoot directly into the pile of tinder because it will scatter all over the forest floor.

A butane lighter, a metal match or wooden matches dipped in paraffin and carried in a waterproof container are invaluable in the outdoors.

ENERGY NEEDS

Energy requirements are sustained by adequate supplies of water and food. Notice that water is mentioned first. Man can live without food for three weeks or more. Without water he may dehydrate within a few days, depending on the climate and amount of exertion. The minimum daily requirement is two to three quarts. The body loses water through perspiration, respiration and urination. As dehydration begins, headache, thirst, increased pulse rate, dizziness, absence of saliva and nausea occur. A sure sign of dehydration is dark orange urine.

Quick recovery follows a sufficient intake of water. In mountainous areas, water runs freely in creeks or springs. To find water in other areas, dig in damp, low, vegetated areas. If you are unsure about the water's purity, boil it. Hot liquid is better than cold anyhow, since it would be heated internally which requires energy.

FOOD NEEDS

Although the need for food is not as urgent as water, you will remain efficient, alert and confident if you satisfy your hunger. Many sources of food exist but you must learn to recognize them. Your gun or fishing rod provides the best means of taking a meal. However, don't waste ammunition. Learn how to make and use a snare, trap, deadfall, net, bow and arrow, sling shot or spear when a gun or fishing gear is unavailable. Cook all meat and fish. Become familiar with edible plants such as nuts, berries,

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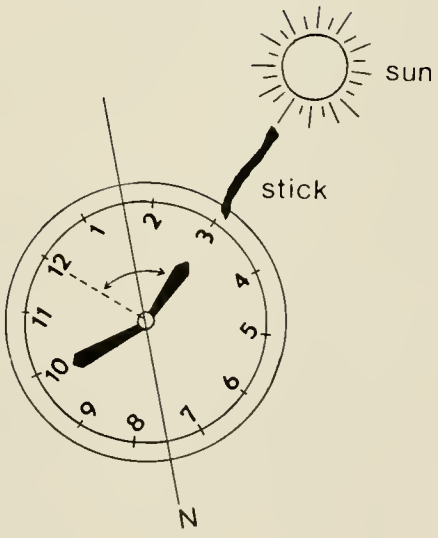
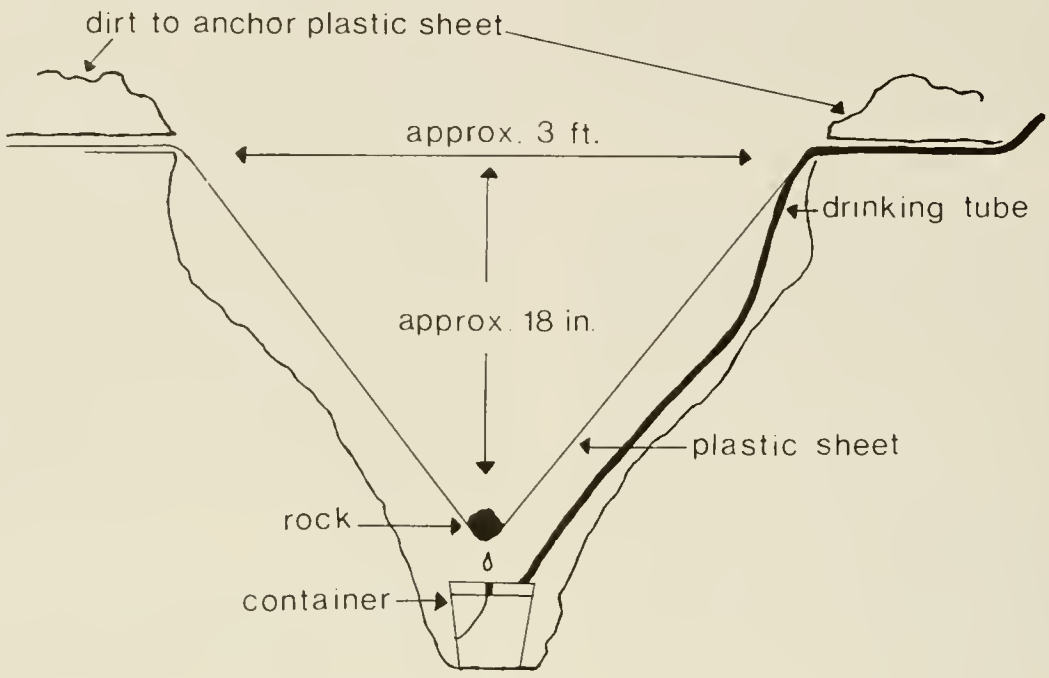


To find north with your watch, point the hour hand directly at the sun. The point halfway between the hour hand and 12 o'clock will be SOUTH.
The match or stick is to give you a line-up shadow for the hour hand if you think you need it. Hold the watch level when you do all this.



This cross section of a survival still illustrates how heat from the sun vaporizes ground water. Then this vapor condenses under plastic, trickles down and drops into the container.

roots, grain, fruit and even tree bark. Always carry high energy food supplements to sustain life in an emergency.

SHELTERS

The type of shelter needed depends on time of year and terrain. Plan for the worst and disregard the probability of early rescue. Build the most secure and comfortable shelter you can—one that will require little maintenance once constructed. The importance of doing the job well while you are able cannot be overemphasized.

Recall the situation of the 13-year-old boy mentioned earlier. Some cut boughs placed on the ground in a depression by a tree served as his shelter. A fire, with logs or stones to serve as reflectors, heat this modest shelter.

In timbered terrain, construct a lean-to of small trees and interwoven boughs. Plastic material or a poncho will aid greatly in lean-to construction. If snowdrifts are deep enough, dig a snow cave. (They are difficult to dig without getting wet and are therefore less desirable than other types of shelters.) In timbered country, where snow is deep, remove snow underneath a spruce tree to provide a shelter. Branches at snow level form the roof and other branches may be cut and placed around the edges.

RESCUE PREPARATIONS

You have provided for the basic life requirements of warmth, energy and shelter. Now you must prepare for rescue. In Montana, if the person's general location is known, he is usually found within 24 hours after being reported lost. It is both helpful and a hindrance to know this. Psychologically, it is encouraging to know that you will be found quickly. On the other hand, some people realize this and may be careless in survival procedures. They might fail to build an adequate shelter, or fail to provide sufficient wood, water or food.

Members of search and rescue teams say it is best to stay in one place when lost, especially if you think a rescue team is searching for you. If it is absolutely necessary to abandon camp and travel, leave a note—in the snow, with the lead point of a bullet on a piece of paper or with stones, for example—indicating direction of travel, time and date of departure and details of your condition. Leave a direction arrow of small logs, branches or strips of fabric on the ground, large enough to be seen by aircraft. Do everything possible to help the search team locate you.

The international distress signal is three of anything—three shots, three blasts on a whistle or three fires in a triangle. Three shots is a fairly normal shot series in a hunting situation, so it is probably better to space them at one-minute intervals if enough ammunition is available. If you have only a few shells, save them. Space signal fires evenly; use green wood on a hot fire to produce smoke.

If there is an open area easily spotted from the air, stamp a large "X" in the snow or construct one from any contrasting material in the area such as boughs or branches. Familiarize yourself with standard ground-to-air signals.

PRECAUTIONS

Certain precautions may be taken to avoid becoming lost or at least to minimize the dangers. Always inform someone where you intend to go and the approximate time of your return. If you should become lost or injured, search and rescue efforts will not be delayed or misdirected. It seems people call either too early or too late. A hunter due home at 4 p.m. often is reported lost by 6 p.m. and many times he is found in a bar along the way at 8 p.m.

Sometimes 24 hours will pass before a person is reported missing, and by that time it may be too late. That 24 hours is important and often the critical period when becoming lost. Each situation is different, so use good judgment and common sense when contacting rescue personnel.

Familiarize yourself with the terrain as you are walking and look back and try to pick out landmarks. Keep these "landmarks" in mind—they can guide you to your vehicle on the return trip. Allow sufficient time to return to camp or your vehicle before dark. Avoid rough and precipitous terrain because a fall can result in serious injury. Obviously, a map of the area will help determine your location.

Warm clothing and suitable footwear are extremely important. Wool items maintain warmth even when wet. Remember, the temperature can vary drastically between low altitudes and higher elevations.

Know the symptoms of exposure and hypothermia. Look back at the first survival situation discussed. The man apparently suffered a degree of exposure and hypothermia. Cold kills in two distinct steps. The first involves exposure and exhaustion. When the body loses heat faster than it produces it, exposure begins. If you then exercise to stay warm, your body makes adjustments to preserve normal temperature in the vital organs. Second, if you are exposed until energy reserves are exhausted and cold reaches the brain, it deprives you of judgment and reasoning power and you will lose control of your hands—this is hypothermia. Internal temperature decreases. Without treatment, hypothermia leads to stupor, collapse and death. The primary defense is avoiding exposure entirely. Other aids to averting hypothermia are: (1) Stay dry. When clothes get wet, they lose up to 90 per cent of their insulating value. (2) Beware of the wind. Wind refrigerates wet clothes by evaporating moisture from the surface. (3) Understand cold. Most cases of hypothermia develop when the air temperature is 30-50°. This is hard to believe, but it is the water temperature against your body that does the damage and 50° water is *unbearably* cold. (4) Put on any extra clothes you might have with you before you get wet. (5) If you have uncontrollable fits of shivering, get out of the weather immediately and build a fire.

A survival kit should be carried on any outdoor trip to provide for warmth, energy and shelter. A map and compass are helpful additions. An example of items that may be included is found on page 42. The kit must be small enough to carry at all times; it does no good when left in the glove compartment of your vehicle.

Remember, a clear head is the most important survival tool. Avoid panic. If you become lost S-T-O-P—Stop, Think, Observe and Plan. Once you have admitted that you are lost and have resigned yourself to that fact, follow survival procedures. Provide for (1) warmth, (2) energy, (3) shelter and (4) prepare for rescue. By following these simple rules you'll pass the final test in any survival situation.

BUCKSKIN NETWORK

The following radio stations broadcast emergency messages at 6:59 a.m., noon, 7 p.m. and 10 p.m. If you wish to place an emergency message, call the nearest law enforcement agency. *Do not* call the radio station directly.

City	County	Call letters	Call numbers (kilocycles)
Baker	Fallon	KFLN	960 KC
Billings	Yellowstone	KURL	730 KC
Dillon	Beaverhead	KDBM	1490 KC
Great Falls	Cascade	KARR	1400 KC
Havre	Hill	KOJM	610 KC
Hamilton	Ravalli	KLYQ	980 KC
Kalispell	Flathead	KOFI	1180 KC
Lewistown	Fergus	KXLO	1230 KC
Libby	Lincoln	KLCB	1230 KC
Missoula	Missoula	KYLT	1340 KC
Missoula	Missoula	KYSS	930 KC
Shelby	Toole	KSEN	1150 KC
Wolf Point	Roosevelt	KVCK	1450 KC

BIG GAME SCENES FOR FRAMING

see page 15